

How much would you pay?

Adapting Fee-Based Agricultural Advisory
Services to Mountainous Regions in Tajikistan

Seminar für Ländliche Entwicklung | Centre for Rural Development

SLE has been offering practice-oriented vocational education and training for future experts and managers in the field of international development cooperation since 1962. The courses range from Postgraduate Studies to Training Courses for international experts in Berlin to practice-oriented research and Consultancy for Organizations and Universities active in the field of development cooperation.

Erik Engel

M.A. Ethnology and Geography; Consultant

E-mail: engel.erik1@gmail.com

Judith Emmerling

M. Sc. Agricultural Economics

E-mail: judith.emmerling@gmail.com

Tim Niepel

M. Sc. International Economics

E-mail: t.niepel@posteo.de

Anna Peter

M.A. European Studies

E-mail: anna.peter@outlook.com

Cristina Simonetti-Techert

M.A. International Studies and Diplomacy

E-mail: simonetticri@gmail.com

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Editor	<p>Humboldt-Universität zu Berlin SLE Postgraduate Studies on International Cooperation Dr. Susanne Neubert</p> <p>Hessische Str. 1-2 10115 Berlin Germany</p> <p>Tel.: +49 30 2093-6900 Fax: +49 302093-6904</p> <p>E-Mail: sle@agrar.hu-berlin.de Website: www.sle-berlin.de</p>
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Foreword

For 52 years, the Centre for Rural Development (SLE – Seminar für Ländliche Entwicklung), Humboldt-Universität zu Berlin, has trained young professionals in the field of German and international development cooperation.

Three-month practical projects conducted on behalf of German and international organisations in development cooperation form an integral part of the one-year postgraduate course. In interdisciplinary teams and with the guidance of experienced team leaders, young professionals carry out assignments on innovative future-oriented topics, providing consultant support to the commissioning organisations. Involving a diverse range of actors in the process is of great importance, which entails conducting surveys from the household level all the way to decision makers and experts at the national level. The outputs of this “applied research” directly contribute to solving specific development problems.

The studies are mostly linked to rural development (including management of natural resources, climate change, food security or agriculture), cooperation with fragile or least developed countries (including disaster prevention, peace building, and relief) or the development of methods (evaluation, impact analysis, participatory planning, process consulting and support).

Throughout the years, SLE has carried out over two hundred consulting projects in more than ninety countries, and regularly publishes the results in this series. In 2014, SLE teams completed studies in Kenya, the SADC region, Paraguay, Cambodia and Tajikistan.

The present study was commissioned by the Program “Framework and Finance for Private Sector Development in Tajikistan” of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, in co-operation with the Sustainability Market – Germany, State Office Bavaria at the International Training and Conference Centre Feldafing and implemented with the participation of the Centre for Strategic Research under the President of the Republic of Tajikistan, represented by Rahman Jahan Afruz Daring.

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Director of the Albrecht Daniel Thaer-Institute
at the Humboldt University of Berlin

Dr. Susanne Neubert
Director of the Centre for
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GIZ representatives in Tajikistan as well as in Germany were highly supportive. Jürgen Richter of GIZ Feldafing and Reinhard Woytek of GIZ Dushanbe made the whole study happen, from first ideas to concrete implementation. Their inputs were appreciated throughout the process and their critical feedback was most valuable. Zarangez Mahmudova impressed us with her energy and in-depth knowledge of field activities – as did Torsten Swoboda, Hartwig Ungethüm and Joachim Lenz, from whose extensive experience we greatly benefited. We would also like to thank the entire GIZ team in Dushanbe for their fantastic support in logistical and administrative matters.

The management of Sarob, in particular Muhammadi Muminov and Rizo Urinbaev, shared with us their knowledge and plans during meetings and workshops. We hope that our study contributes to the success of their work. Many national and international experts working for ministries, research institutions or international organizations received us with open arms and gave us insights and their viewpoints, during work and privately. We look back fondly on many inspiring encounters for which we are grateful. Particular mention goes to MSDSP in Rasht and Caritas in Muminabad who helped us arrange the field visits and group discussions despite their workload.

We are equally grateful to Georg Bokeloh and Hermann Kreutzmann, Volker Niehoff and Mo Boutros-Fischer, who accompanied our preparations, as well as the entire SLE team, in particular Anja Kühn, who assisted with feedback and moral support when needed.

Last but not least we want to thank the agronomists and farmers who found time to receive us, to discuss with us and to share with us one of the greatest aspects of working in Tajikistan – the incredible hospitality.

Executive Summary

Agricultural advisory services can contribute directly to economic growth and poverty reduction. In agriculture-based economies like Tajikistan, advisory services have also been an instrument for diversifying production and increasing the yield and income of rural farmers. This study assesses the possibility of developing a viable, fee based approach for an agricultural advisory service for remote and lower-potential areas in Tajikistan.

Since 2011, GIZ has supported a fee-based agricultural advisory system for individual farmers, which has proven successful in Tajikistan's cotton-growing lowlands. The system is based on an umbrella organization for agricultural advisors – Sarob – which provides different services (e.g. training, access to credit and machines) to its members. While farmers obtained higher yields through the agronomists' support in the lowlands, and paid their fees, it was not possible to replicate this success in the pre-mountainous and mountainous regions.

The study shows that an adapted fee-based advisory service in mountainous regions is feasible. There is a relevant demand for quality services as well as willingness and capacity to pay for services, provided they yield benefit. Motivated agronomists are ready to further explore their private enterprise and wish to be supported in order to better serve their clients' needs and demands. Such a fee-based system, however, is only possible if the following conditions are met:

- Mountainous regions gain importance within Sarob;
- Sarob members build a reputation for quality advice;
- The supply of inputs is further improved;
- Other streams of income for agronomists are further developed.

Short-term recommendations

Sarob's visibility as a guarantor of quality services should be strengthened. Regional representatives, a logo, the distribution of information material and information sessions are possible means of increasing the organization's visibility. At the same time, Sarob's services have to be relevant, of good quality and sustainable for mountainous regions. We recommend continuing and strengthening the on-going activities of Sarob: further training on a wider range of topics needs to be provided, access to inputs needs to be facilitated and different financing strategies for agronomists need to be identified.

Training: All Sarob training initiatives should be tailored to farmers' needs and allow agronomists to provide more applicable and more relevant advice and services. According to most farmers, quality services consist of regularly updated knowledge and precise and easily applicable advice based on regular field visits. In this regard, Sarob could provide hands-on training on farming techniques and new crop varieties to their agronomists.

Furthermore, training on legal reforms related to land rights and land use should be offered to strengthen agronomists' knowledge of ongoing reforms. The findings of the study show that only 21 % of the farmers interviewed are aware of their right to sell their land certificate, and thus indicate the need to strengthen their awareness of land rights. A lack of ownership might decrease farmers' willingness to invest. However, such investments are often crucial for successfully implementing the advice of an agronomist. In order to increase the farmers' willingness to invest in agriculture, Sarob should also offer training on farm management, including cost-benefit analyses, bookkeeping and investment planning, so that farmers perceive farming as a business rather than as an obligation.

Along with training on legal reforms and farm management, Sarob should mainstream natural resource management into their training, specifically water-saving irrigation techniques, promotion of less water-intensive crops, as well as basic cropping techniques that contribute to combating erosion.

External Services: Additional sources of income are vital for the agronomist, as agronomists can only cover about half of their monthly expenses through advisory services. While our findings indicate that farmers are willing to pay about 75 TJS per ha and season (15 US\$), an agronomist needs about 1400 TJS (280 US\$) to cover his monthly expenses. Based on these figures, agronomists are able to finance about 46 % of their monthly expenses through advisory services. Sarob could support agronomists in identifying additional income sources in the following areas: agricultural services (pruning, spraying), input provision, access to machinery and credits and natural resource management.

Spraying and pruning: Agronomists have the potential to expand services on pruning, spraying and pest control as they offer highly demanded hands-on services for which they can easily charge. During Sarob training courses, the importance of protective gear and health-conscious use of the products should be stressed.

Input Provision: Agronomists could generate additional income by facilitating the provision of inputs. More than 50 % of the farmers interviewed indicated access to water, seed quality, fertilizer and access to mechanisation as the main bot-

tlenecks impeding improved production. Farmers indicated that the provision of good quality agricultural inputs is especially challenging, as they are costly and often difficult to find on the local markets. As a result, agronomists could facilitate and promote access to high quality seeds, fertilizers and pesticides. Sarob could negotiate, on behalf of the agronomists, a fee for linking farmers with suppliers of certified and quality inputs. In order to convince the farmers of the added value of investing in better, certified inputs, Sarob should continue to support demonstration plots (with a decreasing share) as incentives for agronomists to disseminate new varieties.

Machinery: Agronomists can further be involved in the promotion of machinery suitable for mountainous regions. The machines must be affordable and appropriate for small plots. Sarob is currently identifying input suppliers of multi-purpose machines with different supplements. Once suitable input suppliers have been identified, Sarob should link them to the agronomists, who could then market the machines and receive a commission for every successful transaction.

Finance: Sarob should continue negotiations with microfinance institutions (MFIs) to grant clients of Sarob agronomists access to credits on preferential terms for the purchase of machinery. A further additional income for agronomists could consist of the dissemination of information on the financial products of different available MFIs, which would pay for those promotional services. Agronomists can assist farmers in developing their business plan and conducting cost-benefit analysis. Business plans made under the auspices of agronomists should ease assessment by loan officers. However, agronomists should not be too closely affiliated to the financial sector in order to maintain the trust of their clients and their independence as advisors.

Natural resource management (NRM): Yet another source of income could be the provision of services protecting public goods, specifically in the field of natural resource management. Agronomists could be involved in the planning and planting of live fences around fields and other practices for erosion control, in the installation of drip irrigation systems and in the promotion of more water-efficient crops as well as of fodder plants to reduce pressure on natural pastures. Organizations promoting NRM as well as the government are possible actors that would pay for these services.

Long-term recommendations

In the long run, Sarob will need to explore further options to diversify its range of services in order to respond to agronomists' and farmers' needs in mountainous

regions. The research team has identified three sectors into which to expand in the long run for Sarob and agronomists, namely livestock management, cooperation with community-based organisations and engagement in downstream value chains.

Livestock Management: Some farmers are even more willing to pay for livestock management than for advisory services increasing their yields. Advisory services covering livestock are therefore a potential entry point for Sarob but will require the involvement of other actors (e.g. veterinary physicians) and the development of an appropriate approach to pasture management.

Community-Based Organisations: CBOs can be used to promote the services of agronomists to a new district and to support the collection of fees. However, the current potential of CBOs seems limited. The majority of the farmers interviewed stated that local organizations have a minor influence and 64 % are not members of any local organization. Thus, a substantial effort is required to strengthen local organizations in order to enable them to play a role in supporting the establishment of a fee-based advisory system. Cooperation with CBOs should thus be launched on a pilot basis only to assess potential and options.

Value Chains: Marketing of mountain crops does currently not pose a primary problem for producers in the country. However, the potential of a stronger link between producers and downstream value chains needs to be explored. Agronomists and Sarob could play a “matchmaker” role between production and processing. Up to the present, several challenges, such as acute cash needs, limited storage facilities, poor road conditions and the limited number of processing facilities, have hampered the development of new value chains, but since various programmes to strengthen such structures exist, agronomists should not miss the opportunity to be involved in these structures.

Conclusion

On a more general level, the research shows that a fee-based advisory service does have potential in disfavoured regions provided the quality of services is adequate. Agronomists need further support to provide quality services going beyond purely verbal advice, support which has to be provided by an entity facilitating certain processes and ensuring quality of services. In the short term, this support should focus on facilitating the provision of inputs and machinery and on updating the knowledge of Sarob members. A fee-based system, however, can only be one approach within a mixed offer of services within a region, as it targets mainly

commercial farmers. Government and donor coordination are of paramount importance in making full use of potential synergies between the existing approaches.

Background information

Agencies involved in the survey: The GIZ-run Framework and Finance for Private Sector Development (FFPSD/GREAT) aims to support sustainable and pro-poor growth in the Tajik economy, especially in rural areas. The German Ministry for Economic Cooperation (BMZ) and the UK Department for International Development (DfID) finance the programme. The Centre for Rural Development (SLE) of the Humboldt University in Berlin has been offering practice-oriented vocational education and training for future experts and managers in the field of international cooperation and development cooperation since 1962. The Centre for Strategic Research under the President of the Republic of Tajikistan is a governmental, scientific, analytical research organization that reports directly to the President of the Republic of Tajikistan. The Centre produces and promotes research reports, expert assessments and analytical notes.

Survey Regions: The survey was conducted in Rasht and Eastern Khatlon, two mountainous regions in which FFPSD operates with the support of its implementing partners. In order to account for the geo-climatic and infrastructural differences within the survey region, data collection took place in higher and lower lying regions of the respective areas. To cover more as well as less privileged municipalities in terms of access to markets, main roads and other infrastructure, the commercial farms selected for interviews were situated in central and remote Jamoats (rural municipalities) of each region.

Method Mix: A variety of qualitative and quantitative data collection methods were applied to enable cross-checking and triangulation of responses: Semi-structured interviews with experts, agronomists and actors throughout the value chain; structured interviews with farmers; group discussions; observations during field visits; analysis of secondary data as well as workshops.

Key concepts applied: a) Farming system analysis to understand mountain agriculture in the survey region; b) advisory services to position the ambitious fee-based system within the general debate; c) assessing the willingness to pay – operationalized with the Contingent Valuation Method; and d) Human Capacity Development: as a relevant expected output of the study aimed at training on the job of young professionals from various partner institutions in Tajikistan as well as engaging in mutual learning throughout the research.

How to read the report

The study is divided into 5 chapters and caters to the needs of different readers. Practitioners in Tajikistan will be most interested in the results of the research, and in recommendations drawn from those results. They should read chapters four and five:

- In chapter 4, the research team presents the main results of the study: 4.1 – 4.3 describe the framework conditions and farmers interviewed, as well as the situation of advisory services in mountainous regions. 4.4 – 4.9 analyse the farmers' WTP for such services as well as potential alternatives to the status quo through provision of extra services or using community-based approaches and the consideration of natural resource management.
- The last chapter presents recommendations for the future adaptation of the advisory system to mountainous regions in Tajikistan and puts the results into the context of the general debate on advisory services.

The first three chapters provide background information for readers less familiar with the region and interested in the theory and methodology behind the report.

- The first chapter describes the problem statement of the study and the country context.
- The second chapter introduces the key concepts that underlie the study: farming system analysis, advisory services and willingness to pay (WTP).
- Chapter 3 provides an overview of the methodology including sample selection and the concept of Human Capacity Development.

Zusammenfassung

Landwirtschaftliche Beratungsdienste können unmittelbar zu wirtschaftlichem Wachstum und zu Armutsminderung beitragen. In landwirtschaftlich geprägten Ländern wie Tadschikistan sind sie ein Instrument, um zur Diversifizierung und zur Erhöhung der Erträge und des Einkommens der Bauern beizutragen. Diese Studie beurteilt die Möglichkeit, ein nachhaltiges, beitragsfinanziertes Beratungssystem für abgelegene Regionen Tadschikistans zu entwickeln.

Seit 2011 unterstützt die GIZ ein beitragsfinanziertes Beratungssystem, das sich in den Ebenen Tadschikistans mit überwiegender Baumwollproduktion bewährt hat. Der Ansatz stützt sich auf eine Dachorganisation für landwirtschaftliche Berater, Sarob, die ihren Mitgliedern verschiedene Dienstleistungen (Fortbildungen, Zugang zu Produktionsmitteln) anbietet. Während Bauern durch Beratung von Sarob-Agronomen in den Ebenen höhere Erträge erzielten und für die Dienstleistung zahlten, konnte dieses System nicht erfolgreich auf Bergregionen übertragen werden.

Die Studie zeigt, dass ein angepasster, beitragsfinanzierter Beratungsdienst seine Reichweite auch in Bergregionen erweitern kann. Es gibt eine relevante Nachfrage nach hochwertigen Dienstleistungen und die Bereitschaft sowie Kapazität, dafür zu bezahlen – vorausgesetzt, sie bringen Erträge. Motivierte Agronomen sind bereit, solche Dienste als private Unternehmer anzubieten, benötigen aber Unterstützung, um die Ansprüche ihrer Kunden besser zu erfüllen. Solch ein beitragsfinanziertes System ist allerdings nur umsetzbar, wenn:

- Bergregionen in der Dachorganisation Sarob an Bedeutung gewinnen,
- Sarob-Mitglieder es schaffen, ihren Ruf als Dienstleister zu etablieren,
- die Versorgung mit Inputs weiter verbessert wird und
- andere Einkommensmöglichkeiten für Agronomen erschlossen werden.

Empfehlungen zur kurzfristigen Umsetzung

Sarobs Ruf als Garant für hochwertige Dienstleistungen sollte gestärkt werden. Regionale Vertreter_innen, ein Logo, die Verbreitung von Informationsmaterial und Informationsveranstaltungen sind mögliche Faktoren, die Sichtbarkeit erhöhen. Gleichzeitig müssen die Leistungen der Agronomen relevant, hochwertig und nachhaltig für Bauern in den Bergregionen sein. Wir empfehlen daher, die existierenden Aktivitäten von Sarob weiterzuführen und auszubauen: Fortbildungen zu einer breiten Anzahl von Themen müssen angeboten, der Zu-

gang zu Produktionsmitteln muss erleichtert und verschiedenen Finanzierungsstrategien für Agronomen müssen identifiziert werden.

Fortbildungen: Alle Trainings sollten sich an den Bedürfnissen der Bauern orientieren und den Beratern ermöglichen, umsetzbare und relevante Dienste für die Kunden anzubieten. Nach Aussage der meisten Bauern beruhen gute Dienstleistungen auf regelmäßig aktualisiertem Fachwissen, häufigen Feldbesuchen und genauen und umsetzbaren Ratschlägen. Dazu kann Sarob seinen Mitgliedern Fortbildungen zu modernen Anbaumethoden sowie neuen Anbaufrüchten anbieten.

Zudem sind Fortbildungen im Bereich der Landrechtsreform und der Landnutzung nötig, um die Kenntnisse der Agronomen zu diesen laufenden Neuerungen zu stärken. Nach den Ergebnissen der Studie wissen nur 21 % der Bauern, dass sie ihre Landtitel verkaufen dürfen. Dies deutet auf die Notwendigkeit hin, ihr Wissen um diese Landrechte zu stärken: mangelnde Sicherheit um die Landnutzungsrechte kann die Bereitschaft, in den Boden zu investieren, beeinträchtigen. Solche Investitionen sind aber oft nötig, um den Rat der Agronomen erfolgreich umzusetzen. Weiterhin sollte Sarob Fortbildungen zu Betriebsmanagement anbieten, die Kosten-Nutzen-Rechnung, Buchhaltung und Investitionsplanung beinhalten, sodass Bauern das Potential von Investitionen erkennen und ermessen können.

Neben den oben genannten Angeboten sollte Sarob Naturressourcen-Management als Querschnittsthema in seinen Trainings behandeln, insbesondere wassersparende Bewässerungstechniken, die Bewerbung weniger wasserintensiver Anbaufrüchte sowie Anbaumethoden, die z.B. zur Reduzierung von Erosion beitragen.

Dienstleistungen an Dritte: Zusätzliche Einkommensquellen sind für die Agronomen notwendig, da sie nur ca. die Hälfte ihrer monatlichen Ausgaben über Einkommen von Beratungsdiensten decken können. Während die Ergebnisse besagen, dass Bauern 75 TJS (15 US\$) pro Hektar und Saison zu zahlen bereit sind, benötigen Agronomen ungefähr 1400 TJS (280 US\$) für ihre monatlichen Ausgaben. Laut dieser Zahlen würden Einkünfte aus Beratung ca. 46 % ihrer finanziellen Bedürfnisse decken. Sarob könnte Agronomen dabei unterstützen, zusätzliche Einkommensquellen zu erschließen, wie z.B. praktische Dienstleistungen (Baumschnitt, Pflanzenschutz), die Vermittlung von Produktionsmitteln oder Krediten oder Angebote zum Naturressourcen-Management.

Baumschnitt und Pflanzenschutz: Agronomen haben Potential, ihr Angebot für Baumschnitt und Pflanzenschutz zu erweitern, da diese Dienste nachgefragt und leicht zu verrechnen sind. Innerhalb der Sarob-Fortbildungen sollte die Bedeutung

von Schutzkleidung und der gesundheitskonforme Umgang mit den Mitteln betont werden.

Vermittlung von Saatgut und Dünger: Agronomen könnten durch die Vermittlung von zertifiziertem Saatgut sowie Dünge- und Pflanzenschutzmitteln Zusatzeinkommen generieren. Über 50 % der befragten Bauern bezeichnen den Zugang zu Wasser, zu gutem Saatgut und Düngemitteln sowie zu Landmaschinen als die Hauptengpässe für eine effizientere Produktion. Solche zuverlässige Produktionsmittel sind einerseits kostspielig, andererseits auf den lokalen Märkten schwer zu finden. Daher könnten Agronomen die Verbindung zu zuverlässigen Lieferanten herstellen. Sarob könnte in ihrem Namen einen Rahmenvertrag mit Zulieferern von hochwertigen Produktionsmitteln verhandeln, der Beratern einen Bonus für vermittelte Produkte zuschreibt. Um Bauern vom Nutzen von zertifiziertem Saatgut zu überzeugen, sollte Sarob weiter Demonstrationsfelder (mit abnehmendem Anteil) unterstützen. Dies würde auch die Berater motivieren, für diese neuen Sorten zu werben.

Landmaschinen: Agronomen können stärker in Verbreitungsmechanismen von an die Berge angepasste Landmaschinen einbezogen werden. Diese müssen erschwinglich und auf kleinen Flächen profitabel einsetzbar sein. Sarob sucht aktuell nach Anbietern von solchen Mehrzweck-Maschinen. Sind diese identifiziert, sollte Sarob die Anbieter mit Agronomen in Verbindung setzen, damit diese sie vermarkten können – und für jede gelungene Transaktion einen Bonus erhalten.

Finanzen: Sarob sollte die Verhandlungen mit Mikrofinanzinstitutionen fortsetzen, damit diese den Kunden von Sarob-Beratern Kredite zu Vorzugskonditionen für den Kauf von Landmaschinen gewähren. Eine weitere Einkommensquelle für Agronomen könnte sich durch die Verbreitung von Informationen von Kreditanbietern erschließen, die für diese Werbung zahlen würden. Agronomen könnten Bauern darin unterstützen, Businesspläne und Kosten-Nutzen-Rechnungen zu erstellen. Pläne, die unter Anleitung von Agronomen erstellt wurden, sollten die Bewertung der Kreditwürdigkeit durch Bankangestellte erleichtern. Allerdings müssen die Agronomen auf ihre Unabhängigkeit von den Finanzinstitutionen achten, um nicht das Vertrauen ihrer Kunden zu verlieren.

Naturressourcen-Management (NRM): Eine weitere Einkommensquelle könnte sich durch den Schutz von öffentlichen Gütern eröffnen, i.e.L. dem Schutz der natürlichen Ressourcen. Agronomen können sich an der Planung und dem Anlegen von Lebendhecken um die Felder oder anderen erosionshemmenden Maßnahmen beteiligen. Ebenso können sie die Einrichtung von Tröpfchenbewässerung und die Verbreitung von weniger wasserintensiven Feldfrüchten fördern sowie

den Anbau von Tierfutter, um den Druck auf Weiden zu verringern. Organisationen, die im Bereich NRM tätig sind, sowie die Regierung sind mögliche Kunden für solche Dienste.

Empfehlungen zur langfristigen Umsetzung

Langfristig wird sich Sarob auf weitere anzubietende Dienstleistungen fokussieren müssen, um den Bedürfnissen der Agronomen und Bauern in den Bergregionen nachzukommen. Drei Bereiche werden in der Studie identifiziert, in denen sich Sarob langfristig etablieren kann, nämlich Viehhaltung, die Kooperation mit Anwohnervereinigungen (Community based organisations, CBOs) und Wertschöpfungsketten.

Viehhaltung: Viele Bauern sehen Investitionen in Viehhaltung oft als sinnvoller an als Beratung für höhere Felderträge zu bezahlen. Beratungsdienste, die auch Viehhaltung einbeziehen, sind daher eine mögliche Erweiterung für Sarob. Sie benötigen allerdings die Einbeziehung anderer Akteure (z.B. Veterinäre) und die Entwicklung eines angepassten Ansatzes zum Weidemanagement.

Anwohnervereinigungen (CBO): Solche Vereinigungen können die Dienste der Berater in neuen Distrikten bewerben und beim Zahlungsprozess helfen. Das aktuelle Potential solcher CBOs scheint jedoch begrenzt. Die Mehrzahl der befragten Bauern sagen, dass solchen Vereinigungen nur geringe Bedeutung zukommt und 64 % der Befragten waren nicht Mitglieder von irgendeiner lokalen Organisation. Eine Stärkung solcher Strukturen wäre demnach die Voraussetzung, damit diese eine Rolle für beitragsfinanzierte Beratungsdienste spielen können. Eine Zusammenarbeit mit CBOs sollte daher probeweise und exemplarisch ausprobiert werden, um ihre realen Potentiale zu erfassen.

Wertschöpfungsketten: Die Vermarktung von Landprodukten aus den Bergen scheint nicht ein vorrangiges Problem für Produzenten zu sein. Dennoch sollten die Möglichkeiten für eine stärkere Verbindung zu weiterverarbeitenden Wertschöpfungsketten erhoben werden. Agronomen und Sarob können dabei die Vermittler zwischen Herstellern und der Weiterverarbeitung sein. Bisher behindern fehlendes Kapital, begrenzte Lagermöglichkeiten, schlechte Straßen und die geringe Anzahl an weiterverarbeitenden Betrieben den Aufbau von Wertschöpfungsketten. Allerdings gibt es verschiedene Bemühungen, solche Strukturen zu unterstützen, und die Agronomen von Sarob sollten die Möglichkeit nicht versäumen, darin ihre fördernde Rolle zu finden.

Schlussfolgerungen

Die Studie belegt, dass ein beitragsfinanziertes Beratungssystem auch in benachteiligten Regionen möglich ist, solange die Qualität der Dienstleistungen angemessen ist. Agronomen benötigen Unterstützung, um solche hochwertigen Dienstleistungen jenseits vom gesprochenen Wort anbieten zu können. Diese Unterstützung sollte von einer Struktur gewährt werden, die bestimmte Prozesse ermöglicht und die Qualität der Dienstleistungen ihrer Mitglieder gewähren kann. Kurzfristig sollte diese Unterstützung den Kenntnisstand der Dienstleister aktualisieren und den Zugang zu Produktionsmittel erleichtern.

Ein beitragsfinanziertes System jedoch kann in einer Region nur eines unter diversen Beratungssystemen sein, da es vornehmlich unternehmerisch tätige Bauern anspricht. Die Koordination von Regierung und Gebern ist unabdingbar, wenn Synergien zwischen den verschiedenen Ansätzen ausgeschöpft werden sollen.

Hintergrundinformationen

Beteiligte Institutionen: Das von der GIZ geleitete Programm „Framework and Finance for Private Sector Development (FFPSD)“ zielt auf ein nachhaltiges, breitenwirksames Wirtschaftswachstum Tadschikistans, insbesondere im ländlichen Raum. Das Bundesministerium für wirtschaftliche Zusammenarbeit (BMZ) und das britische Department for International Development (DfID) finanzieren das Programm. Das Seminar für ländliche Entwicklung (SLE) der Humboldt-Universität zu Berlin bietet seit 1962 praxisrelevante Ausbildung für künftige Expert_innen im Berufsfeld der internationalen Zusammenarbeit. Studien wie diese sind Teil der Ausbildung. Das Zentrum für strategische Studien unter dem Präsidenten der Republik Tadschikistan ist eine von der Regierung unterhaltene Institution, die wissenschaftliche und analytische Studien für den Präsidenten durchführt. Das Zentrum liefert Forschungsberichte, Expertenpapiere und analytische Notizen.

Untersuchungsgebiet: Die Studie fand in Rasht und im östliche Khatlon statt, zwei Bergregionen, in denen FFPSD mit Hilfe seiner Umsetzungspartner aktiv ist. Erhebungen fanden in niedriger und höher gelegenen Bezirken statt, um den unterschiedlichen geoklimatischen Bedingungen und Anbindungen an die Infrastruktur Rechnung zu tragen. Bauern aus Gemeinden mit unterschiedlicher Entfernung zu Märkten und Hauptstraßen wurden in jedem Bezirk ausgewählt, um ein möglichst breites Bild der Situation zu erfassen.

Methoden Mix: Verschiedene qualitative und quantitative Erhebungsmethoden wurden angewandt, was eine Triangulation der Ergebnisse ermöglichte: semi-

strukturierte Interviews mit Expert_innen, Agronomen und Akteuren der Wertschöpfungskette; strukturierte Interviews mit Bauern; Gruppendiskussionen; Beobachtungen; Analyse von Sekundärdaten sowie Workshops.

Angewandte Konzepte: a) Die Farming system analysis half, die Berglandwirtschaft in der Untersuchungsregion zu erfassen; b) die Theorie von Beratungsdiensten ermöglichte uns, das ehrgeizige beitragsfinanzierte System in der allgemeinen Debatte zu positionieren; c) die Erhebung von Zahlungsbereitschaft (willingness to pay) wurde durch die „Contingent Valuation Method“ umgesetzt; und d) Human Capacity Development war ein wichtiges Ergebnis der gemeinsamen Durchführung der Studie mit jungen Mitarbeiter_innen verschiedener Partnerinstitutionen in Tadschikistan mit einer gegenseitigen Lernerfahrung im Laufe des Prozesses.

Der Bericht auf einen Blick

Der Bericht ist in 5 Kapitel aufgeteilt und soll die Informationsstände verschiedener Nutzergruppen berücksichtigen. Leser_innen aus der Berufspraxis in Tadschikistan werden i.e.L. an den Ergebnissen der Erhebungen und den Empfehlungen interessiert sein. Sie sollten die Kapitel 4 und 5 zuerst lesen.

In Kapitel 4 präsentiert das Team die Ergebnisse der Datenerhebungen: in 4.1 – 4.3 beschreiben wir die Rahmenbedingungen, die Situation der interviewten Bauern sowie die Beratungsdienste, wie wir sie in den Bergen vorfanden. 4.4 – 4.9 analysiert die Zahlungsbereitschaft sowie mögliche Alternativen zum Ist-Zustand durch zusätzliche Dienstleistungen (Produktionsmittel, Vermarktung, Finanzen, NRM) und die Kooperation mit Gemeindevertretungen.

Das letzte Kapitel präsentiert unsere Empfehlungen für eine Anpassung der Beratungsdienste in Bergregionen Tadschikistans und ordnet die Ergebnisse in die weitere Debatte um Beratungsdienste ein.

Die ersten drei Kapitel geben Hintergrundinformationen für Leser_innen mit weniger Einblick in die Region sowie für Leute mit Interesse an der Theorie, auf die wir uns beziehen, und die angewandten Methoden. Das erste Kapitel beschreibt das Kernproblem, das zum Studienauftrag führte sowie den Landeskontext. Das zweite Kapitel gibt einen Überblick über die theoretischen Konzepte, mit deren Hilfe das Team die Studie konzipiert hat: Farming system analysis, Beratungsdienste im Allgemeinen und Zahlungsbereitschaft (WTP). Kapitel 3 bietet einen Überblick über die angewandten Methoden zur Datenerhebung sowie der Stichprobe und erläutert, wie „Human Capacity Development“ in die Studie einbezogen wurde.

Table of Contents

Foreword.....	i
Acknowledgements	ii
Executive Summary	iii
Zusammenfassung.....	ix
Table of Contents.....	xv
List of Tables	xvii
List of Figures	xvii
Abbreviations	xviii
1 Introduction.....	1
1.1 Problem statement	2
1.2 Structure of the report	4
1.3 Country context	5
2 Key concepts.....	7
2.1 Farming System Analysis and mountain agriculture	7
2.2 Advisory services	11
2.3 Willingness to pay	13
3 Operationalization	15
3.1 Method mix and key components	15
3.2 Sample selection	17
3.3 Scope of the study	18
4 Results	19
4.1 Institutional framework	19
4.2 Agriculture in the research area	24
4.3 Advisory services	32
4.4 Willingness to pay for agricultural advisory services	37
4.5 Role and potentials of inputs in agriculture	42
4.6 Marketing and processing	45

4.7	Finance	50
4.8	Role of community-based organizations	54
4.9	Natural resource management and climate change	57
5	Recommendations	61
5.1	General recommendations	61
5.2	Recommendations – short term	62
5.3	Recommendations – long term	66
5.4	Conclusion	68
5.5	Generalisation	68
6	References.....	71
6.1	Bibliography	71
6.2	Interviews	73
7	Annex	77
	Annex 1: Impact Analysis	77
	Annex 2: Farmer questionnaire	78
	Annex 3: Agronomist questionnaire	91
	Annex 4: Advisory services requested (topic)	98
	Annex 5: Set cards agronomists	99
	Annex 6: Hypothetical Profit & Loss Account and Break Even Analysis	100

List of Tables

Table 1: Responses to questions regarding WTP	38
Table 2: Correlation of income and WTP	40
Table 3: Advices requested (crops)	40
Table 4: Expert interviews	73
Table 5: Focus group discussions	75

List of Figures

Figure 1: Conceptual model of the study	4
Figure 2: Farming System Analysis	8
Figure 3: Flowchart of the CVM scenario	16
Figure 4: Research areas.....	17
Figure 5: Most prominent crop per Rayon.....	25
Figure 6: Yield/ha for selected crops per Rayon	26
Figure 7: Composition of household income	27
Figure 8: Average herd sizes.....	28
Figure 9: Challenges to increasing income from agriculture	31
Figure 10: Distribution of the estimated WTP/ha.....	39
Figure 11: Marketing options and prices for potato per Rayon	47
Figure 12: Membership in CBOs	55
Figure 13: Overview of recommendations	69

Abbreviations

ACTED	Agence d'Aide à la Coopération Technique et au Développement
AKDN	Aga Khan Development Network
AS	Advisory service
BMZ	German Ministry for International Cooperation
CBO	Community based organisation
CC	Climate Change
CIDA	Canadian International Development Agency
CTP	Capacity to pay
CVM	Contingent Valuation Method
DF	Dehkan farm
DfID	UK Department for International Development
DRM	Disaster Risk Management
Exp	Expert Interview (followed by the corresponding number)
FAO	Food and Agriculture Organization of the United Nations
FAST	Farmer Advisory Services for Tajikistan (USAID Support)
FGD	Focus Group Discussion
FFPSD	Framework and Finance for Private Sector Development
GDP	Gross domestic product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Development Cooperation)
GREAT	Growth in the Rural Economy and Agriculture: Tajikistan
HCD	Human Capacity Development
HU	Humboldt University of Berlin
ICNL	International Centre for Not-for-Profit Law
MFI	Microfinance institution
MSDSP	Mountain Societies Development Support Programme
NGO	Non-governmental organisation
NRM	Natural Resource Management
SLE	Seminar für ländliche Entwicklung (Centre for Rural Development)
TAFF	Tajik Agricultural Finance Facility

TAG	Technical advisory group
TajWSS	Tajikistan Water Supply and Sanitation Network
TAM	Technical assistance machinery services
TJS	Tajik Somoni (currency)
UNDP	United Nations Development Programme
USAID	US Agency for International Development
VO	Village Organization
WB	World Bank
WFP	World Food Programme
WS	Workshop
WTP	Willingness to pay
WUA	Water user association
WHH	Welthungerhilfe (German Agro Action)

1 Introduction

Advisory services play a crucial role in the development of the agricultural sector, aiming not only at improving production, but also at contributing to sustainable rural development. Numerous countries are currently implementing strategies for private sector development to facilitate sustainable economic growth and contribute to poverty reduction. The economy of the landlocked Republic of Tajikistan is gradually growing and agricultural production is one of the main economic sectors in the country. However, the private sector is not yet sufficiently organised and integrated into this essential strategic sector.

There are various potential ways to increase the influence of the private sector on agriculture with the aim of improving the livelihood of the rural population of the country. For this purpose, GIZ implements the Framework and Finance for Private Sector Development Programme (FFPSD) on behalf of the German and the British Governments. The Federal Ministry of Economic Cooperation and Development (BMZ) commissioned GIZ, including a significant contribution from the Department for International Development (DfID). DfID's contribution, referred to as Growth in the Rural Economy and Agriculture Tajikistan (GREAT), is an integral part of FFPSD. Within GREAT, GIZ supports agricultural consultants and value chain development as a part of various private sector development support initiatives.

GIZ – through its International Training and Conference Centre Feldafig with its experience in training and long-standing links to mountainous areas (within the Mountain Development Programme) – has commissioned the Centre for Rural Development to conduct a study on the feasibility of the existing fee-based¹ agricultural advisory system in mountainous regions². The study finds that the current advisory system may continue to extend its presence in mountainous regions, if the recommendations detailed here are taken into consideration (chapter 5). These recommendations are based on a specific assessment of challenges and potential within defined research areas (chapter 4), and contribute to the expected outcome of the FFPSD, which is *increased and more inclusive economic growth in rural areas of Tajikistan*.

1 In the context of this study “fee-based” denotes a sustainable agricultural advisory system financed by farmers or potentially by other stakeholders along the value chain receiving services.

2 A detailed impact analysis of the study can be found in Annex1.

2 Introduction

The study team comprised four junior professionals and a team leader from the SLE as well as four Tajik counterparts from different institutions³ also under the guidance of a team leader. Additional preparatory support in Berlin and Feldafing to develop a common understanding of the project context and rationale, study hypothesis and methodology was provided by GIZ.

1.1 Problem statement

The economy of Tajikistan is mainly based on agriculture, and advisory services in the agricultural sector have consistently been an instrument for diversifying production and increase the yield and income of rural farmers (Yu, Mwangi, 2014). After the collapse of the Soviet Union the agricultural sector has been restructured, compromising the functionality of the public agricultural extension service.

Since 2011, GIZ has supported a fee-based agricultural advisory service for individual farmers in Tajikistan. This advisory system is based on a cooperative called Sarob, which is made up of a board of directors and cooperative members, namely agronomists, who advise farmers for a payment (Textbox 1).

The current business model of Sarob has proven successful in the cotton-growing lowlands where farmers obtained higher yields through the use of fee-based advice by agronomists. However, when the business model was applied in pre-mountainous and mountainous regions, the initial success could not be replicated due to various challenges stemming from different agricultural production, marketing and societal conditions. The underlying rationale for the study is therefore to investigate how the current business model of the lowlands could be adapted to serve disadvantaged mountain regions and thereby contribute to increased economic activity.

3 The Centre for Strategic Research under the President of the Republic of Tajikistan, the Institute of Agricultural Economics under the Tajik Academy of Agricultural Sciences, the Tajik Agrarian University, the Ministry of Agriculture and GIZ.

Textbox 1: Sarob

The TAFF (Tajik Agriculture Finance Framework) Project and GIZ (within the FFPSD Programme) decided to support the establishment of a new agricultural advisory system in Tajikistan. The system is originally based on the Australian Advisory System Model in which Technical Advisory Groups (TAGs) – groups consisting of one senior agronomist and up to five field agronomists and in most cases an organizational manager, who work together as an advisory team.

TAGs have a number of needs, which can be met by joint action. For that purpose they have established a commonly owned and jointly managed umbrella organisation – the cooperative Sarob. It was jointly decided by TAGs that Sarob should support them to improve services provided to clients. The membership fee for agronomists (2014) amounted to 500 TJS per year (100 US\$).

Services provided by TAGs to farmers include the weekly crop monitoring and crop management advice. In addition, information on available inputs and machinery services and the offer to support farmers in the establishment of TAMs (small machinery syndicates) are provided. Today there are more and more agronomists working as individual private entrepreneurs offering fee-based advice and services such as pruning and spraying to farmers⁴. The price for advice and services is a matter of negotiation between the farmer and the agronomist.

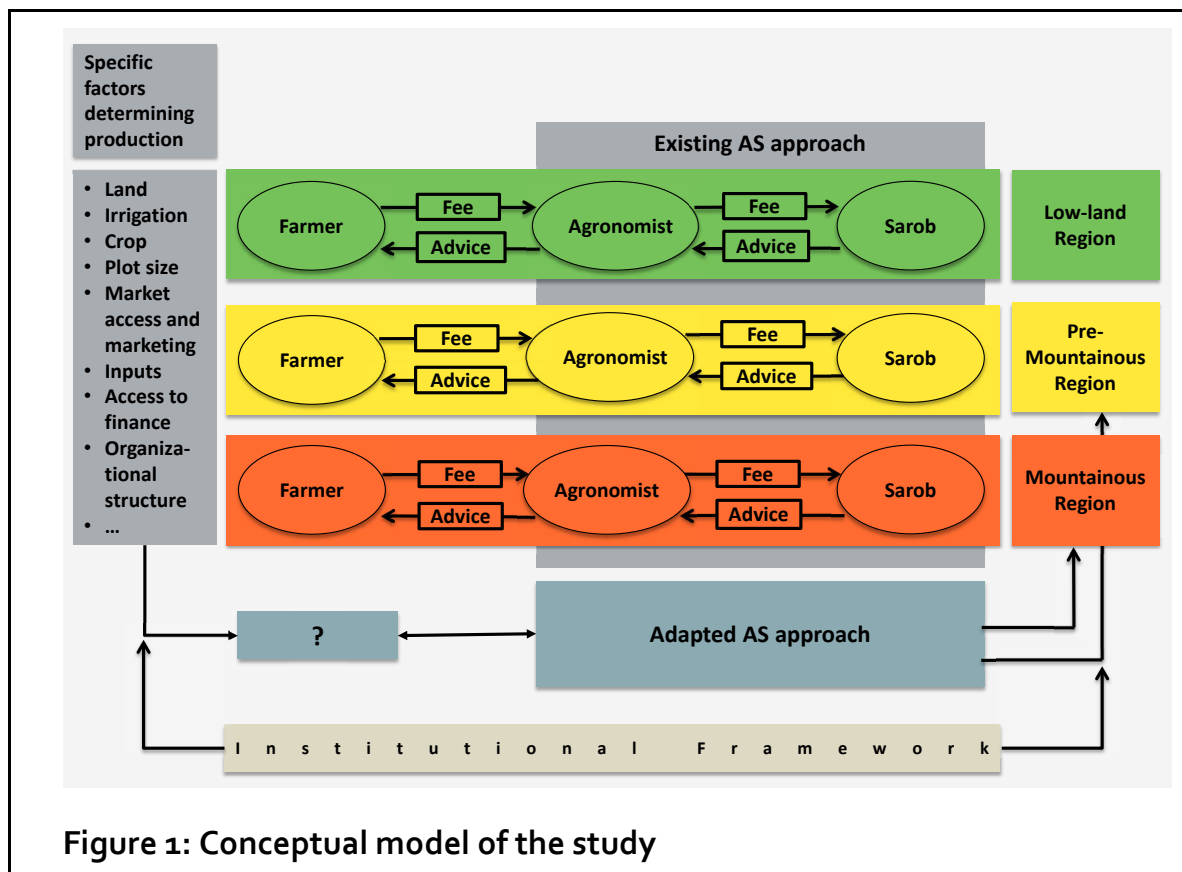
Additionally, Sarob provides services to its members with the aim of improving the agronomists' work in terms of diversification of advisory services and a general increase of outreach. Continuous training on technical issues, facilitation of better access to high quality seed, advice and coaching on the establishment of TAMs have been important activities and main services to members.

The establishment of Sarob has been possible through the support given by GIZ, which backed up the newly introduced advisory system with a stepwise subsidy scheme. TAGs that operated in the 1st year received 50 % subsidies, based on the value of advisory contracts concluded. In the 2nd year, subsidies decreased to 30 %, and in the 3rd year to 15 %. From 2014 onwards the subsidies were abolished completely in all regions. In some mountainous regions, however, subsidies were cut after the first six months due to difficulties in reporting. This unexpected change of the incentive scheme led to mistrust among agronomists toward the cooperative and the newly established system. The main purpose of the advisory cooperative is professional development of its members – this includes the qualification of advisors in terms of know-how, support for members in running tests and demonstrations and last but not least development of advisors' capacities.

4 The study differentiates between advice and services provided by agronomists. Advice is given verbally on different topics while services like pruning and spraying are directly offered and carried out by the agronomist.

4 Introduction

In order to accomplish this, the team elaborated a conceptual model (Figure 1) highlighting the relationship between Sarob and the agronomist (e.g. what kind of support in the form of training, knowledge updating etc. the agronomist needs in order to meet farmers' needs) and the relationship between the farmer and the agronomist (e.g. what kind of advice and services are demanded by farmers). In the conceptual model an upside-down traffic light model is visualized. The well working lowland system is highlighted in green, the partially well working system in pre-mountainous regions in orange and the mountainous system in red. These differences result from specific factors determining production in the respective region (e.g. plot size, availability of irrigated land, social and organisational aspects) as well as the institutional framework.



1.2 Structure of the report

The study is divided into 5 chapters. The introduction is followed by the second chapter, which introduces the key concepts of the study. It includes a short description of farming system analysis and the specifics of mountain agriculture in Tajikistan. Further, different forms of advisory services are characterized and the willingness to pay (WTP) as a theoretical concept and survey method is introduced.

Chapter 3 provides an overview of the applied mixed methodology including the sample selection. Moreover, the chapter gives insight into how the team incorporated the Human Capacity Development concept throughout the study and what it meant for the operationalization of the study. At the end of this chapter the limitations of the study are discussed.

Chapter 4 presents the main results of the study, following the various aspects of methodology discussed previously. The framework conditions and farming systems encountered, as well as the situation of advisory services in mountain regions and farmers' WTP for such services are illustrated. The chapter further describes potential alternatives to the status quo through community-based approaches and aspects of natural resource management within the advisory system.

Throughout chapter 4 a particular focus is put on the implications of the specific results for Sarob. These implications are further elaborated in chapter 5, which finally presents recommendations for the future adaptation of the business model to particularly meet the specific requirements of mountainous regions.

1.3 Country context

Tajikistan is a landlocked country in Central Asia. 93 % of its territory is covered by mountains and almost half of the country lies more than 3000 metres above sea level, which significantly influences agricultural productivity (chapter 2.1). During Soviet times, Tajikistan's main strategic function within the economic system of the Union was the provision of water, which was then used to generate electricity and to irrigate the cotton fields in the wider region. Industrial goods and materials were imported from other Soviet republics. As an independent nation, a need for rescaling the economy and reviewing trade links emerges. Water remains one of the major resources, but its use is currently being reconsidered in order to improve not only agricultural productivity, but also drinking water conditions in the country (Kreutzmann, 2014).

About half of Tajikistan's labour force is engaged in the agricultural sector, which contributes to 19 % of the country's GDP (Textbox 2). Less than 7 % of the land is arable and a fast-growing population leads to decreasing farmland per capita. The most prevalent crop is cotton. Efforts to diversify agricultural production in favour of food crops between 2009 and 2011 resulted in a gradual decrease in cotton production and a strong growth in the agricultural sector. However, in order to trigger further growth, legal reforms such as the land and pasture reform

need to be strengthened and “freedom to farm⁵” guaranteed (Bertelsmann Stiftung, 2014).

Remittances from labour migrants have been the key drivers behind the country’s recent economic growth and progress in poverty alleviation. The equivalent of almost half of Tajikistan’s GDP comes from remittances (ibid.). The poorest rural households finance up to 80 % of their annual consumption through remittances (Danzer, Dietz, Gatskova, 2013).

Textbox 2: Facts about Tajikistan (The World Bank, 2014)

Main agricultural products:	Cotton, maize, potatoes, wheat, fruits, vegetables
Population:	Approx. 8 million
Independence:	1991
GDP per capita, PPP:	2432 US\$
Human Development Index:	133 out of 187
Trade: Import-export ratio:	4:1 (Tajikistan imports about 60 % of its food)

5 Non-interference by local authorities in production decisions.

2 Key concepts

The research is based on three key concepts introduced in this chapter for understanding and analysing Tajik agricultural systems and the potential for production increase through fee-based advisory services: Farming System Analysis and mountain agriculture as the major farming system in the research area, advisory services and the willingness to pay. These concepts are presented in the following section with a specific focus on their relevance for fee-based advisory services.

2.1 Farming System Analysis and mountain agriculture

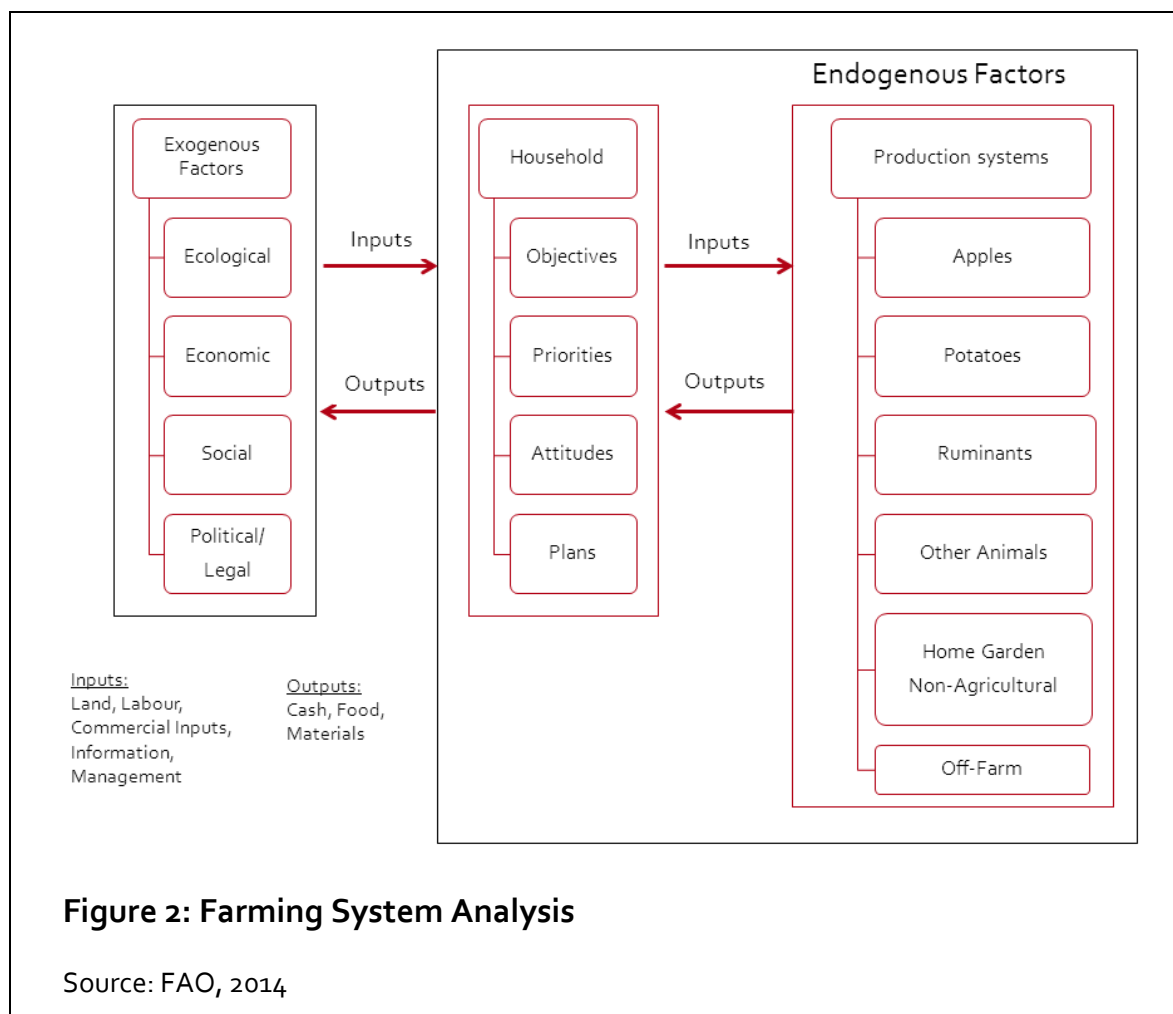
Farming System Analysis provides a comprehensive understanding of production patterns in the Tajik mountains and thus provides the basis for elaborating suitable advisory systems that cater to these regions with their specific socio-economic and ecological conditions. The characteristics of Tajik mountain agriculture are described in order to provide a general understanding of the research context.

2.1.1 Farming System Analysis

The FAO defines farming systems as “*a population of individual farm systems that have broadly similar resource bases, enterprise patterns, household livelihoods and constraints, and for which similar development strategies and interventions would be appropriate*” (Food and Agriculture Organization of the United Nations, 2014). Farming System Analysis has evolved from a focus on agricultural production towards the examination of institutional frameworks that condition the production factors of households (Figure 2). It looks at endogenous and exogenous factors affecting production and economic decisions taken in households.

The present research examines these different categories of factors. Relevant exogenous factors such as historical and legal aspects are briefly highlighted in the following passage. Endogenous factors – mainly the production systems, predominating crops and non-farm income sources as well as the pressure on households to take certain decisions – are discussed in a general way in chapter 2.1.2. The influence of these decisions on social and ecological factors is also taken into account, thus setting the background for the results described in chapter 4.

8 Key concepts



Farming systems in Tajikistan and their classification are still influenced by the legacy of the Soviet Union. The Soviet agricultural system consisted of three different classifications: the kolkhoz, cooperative production societies; sovkhoz, state enterprises; and individual household farms. Nowadays the land reform (Textbox 3; chapter 4.1) has led to the registration of different types of commercial farms: corporate farms, collective Dehkan⁶ farms (DF), family DF, individual DF – besides the widespread individual household plots used mainly for home consumption.

6 Dehkan farm is a term of Persian origin denoting private farms in Central Asia.

Textbox 3: Land reform in Tajikistan (Hierman, Nekbakhtshoev, 2014)

Following independence in 1991, Tajikistan fell into a period of civil unrest (and a civil war) during which agrarian reforms were initiated and collective and state farms transformed into Joint Stock Companies and collective Dehkan farms. As the reform process was slow and superficial, a second phase of reform was initiated in 2006, following recommendations by international lending institutions. The process culminated in an amendment of the Land Code that allows farmers to trade their land use certificates. However, as all the land still belongs to the state, liberalization is limited.

2.1.2 Mountain agriculture

Farming systems in Tajikistan can be differentiated by geographical characteristics. The cotton-growing lowlands with complex irrigation systems and big plot sizes are substantially different to pre-mountainous and mountainous areas.

Mixed agro-pastoral patterns dominate land use in the mountainous regions of Tajikistan as they make best use of the climatic variations and attendant differences in conditions for agricultural production that exist over relatively short distances (Kreutzmann, 2014; Kerven et al., 2011). Most Tajik mountain households rely on a mix of cropping and livestock: grains (wheat), starches (potato), vegetables and orchards are cultivated on irrigated and non-irrigated land and most families own small and large ruminants (sheep, goat, and cows), which are used for dairy and meat production as well as capital reserves.

As a consequence of the limited availability of arable land and of the land reform (chapter 4.1), many rural households produce mainly for subsistence on plots smaller than 0.5 ha with only occasional income from the selling of crops. The trend in these rural areas is towards diversification of livelihood sources, as sole reliance on crops and/or livestock became less secure in the post-Soviet period (Kerven et al., 2011); off-farm activities (trade, salaried work) and migration labour play an important role for mountain household livelihoods – as highlighted in the right column in Figure 2.

The lack of economic opportunity and the diversification of livelihood sources altered gender roles and the division of labour in rural households and, due to labour migration, resulted in many (at least temporarily) female-headed households (University of Central Asia, 2012). This increase in women's workload has, how-

10 Key concepts

ever, not broadly increased their role in decision-making regarding resource utilization, since customary property rights, including animal and pasture land use rights, continue to be attributed through male relatives (Kerven et al., 2011).

Rural societies are marked by growing wealth disparities, fostering social stratification and in consequence a decline in mutual trust and support among rural households. Further, labour migration poses additional challenges to Tajik farming systems. Due to the prevalence of remittances and the consequent monetization of the rural economy, non-migrating families are marginalized due to limited participation in economic transaction. These remittance flows further demote the relevance of agriculture for the livelihoods of rural families, which may lead to less solidarity among farmers (Rowe, 2010). As a result, people prefer to work on their own and distance themselves from new forms of cooperation (chapters 4.3, 4.8; Kerven et al., 2011). This leads to new forms of dependencies between local households, which cannot be ignored by an advisory service trying to promote good agricultural practices (Spoor, 2004).



Field visit, interview phase. Askalon, Rasht valley

Photo: E. Engel

Natural pasture constitutes the principal land area in mountain regions. An urgent need for locally produced staple food after the disruption of Soviet economic exchange patterns and a growing population has led to the overuse of pasture land and the opening of fields on steeply inclined mountain sides, which has contributed to soil erosion. This altered land use also increases the risk of natural hazards (chapter 4.9), which is further altered by the as yet unforeseeable consequences of climate change (Barbone, Reva, Zaidi, 2010).

2.2 Advisory services

There is an array of different agricultural extension or advisory service systems. Whereas these systems were mainly public in the past, a shift towards combined systems of public and private agricultural services has emerged. Nowadays the livelihoods of the rural poor are the centre of attention, which leads to a more holistic understanding of advisory services (Swanson, Rajalahti, 2010). The literature distinguishes extension services from advisory services, the terminology employed often depending on the respective institution.

Following a shift in advisory services, focusing more on the livelihood of farmers rather than on food security, the institutional environment in which agricultural production takes place gained importance for agricultural advisors. Tajikistan, with many incomplete changes in the legislation (chapter 4.1), deserves special attention. Other exogenous factors (also highlighted in figure 2), such as supporting industries, marketing channels or infrastructure, additionally influence productivity (chapter 4.5, 4.6). Effective advisory services thus need to be sensitive to the needs farmers have related to these issues – and can serve as change agents by spearheading innovation based on their advanced knowledge and privileged access to information and inputs.

The discussion of whether public or private advisory and extension systems are more appropriate is still ongoing. A public system is essential for small-scale farmers focusing on food security and improved livelihoods (Swanson, Rajalahti, 2010). However, it is criticized for limited resources, insufficient quality of advice and the absence of incentives for agronomists to proactively support farmers (Anderson, Feder, 2003). A public or subsidized system needs resources and the willingness of permanent institutions to continuously support it, a situation that does not currently obtain in Tajikistan.

12 Key concepts

Private systems may overcome these disadvantages, as no farmer will pay the price demanded by the advisor if he or she is not satisfied with the service offered. Information itself is difficult to sell, words and knowledge being difficult to monetize. Frequently, the provision of inputs and other services, combined with the transfer of know-how, are a means of generating profit, focusing especially on bigger, more commercially-oriented farms (Chapman, Tripp, 2003). Critiques of this approach point to the fact that poorer farmers or farmers with difficult production conditions will be further disadvantaged as they lack the resources to pay for private services.

Especially in remote areas, comparable to the regions analysed in this study, farms are more difficult to access and farmers tend to be more risk averse, leading to increased costs and a diminished efficiency of the advisory service. Many advisory systems are therefore set up as public-private partnerships. While the public share is in charge of disseminating knowledge among agronomists, the actual advice is organized privately (comparable to Sarob) (Rowe, 2010).

Agriculture in Tajikistan, as in other former Soviet countries, faces some peculiar challenges, which require a well-functioning advisory system. After the collapse of the Soviet Union, land-use rights were assigned to many farmers who had no experience or knowledge of agriculture (Mandler, 2010). This lack of experience often results in low productivity and low income from agricultural production (chapter 2.1, 4.2). The role of agricultural advisory services is thus to contribute to improved production and higher income for the rural population. However, the promoted agricultural practices should foster sustainable and adapted utilisation of natural resources in order to contribute to long-term poverty reduction. They should therefore take specific conditions and socio-economic trends into consideration. Public interest in a functioning agricultural advisory service stems from, among other things, the significance of the Tajik mountains for the economy, namely their contribution to national food security and increasing local income. It is further justified by additional interests in the preservation of the multiple functions of the area for a) the storage and release of water indispensable for agricultural production in lower-lying regions and neighbouring countries, b) long term energy provision and finally c) tourism development (Yu, Mwangi, 2014).

Currently, different advisory services exist in Tajikistan. The Ministry of Agriculture employs state extension officers on a provincial level, who advise farmers. However, the efficiency of the system is doubtful (Mandler, 2010). Other advisory activities are donor-driven, often promoting farmer-to-farmer approaches. The specialised donor-driven services are mostly free of charge and exist mainly in

form of training and are linked to seed and input provision. In the private sphere, some companies exist that mainly focus on the provision of machinery and seeds. The internal advisory systems of collective farms work well in cotton growing areas, as a lot of information is available within the group. Similar forms of knowledge sharing exist in higher valleys but usually lack sources of innovation. A lack of coordination between the different systems hampers their overall functionality and efficiency (Mandler, 2010).

The coexistence of these different approaches to advisory services poses specific challenges to the fee-based approach of Sarob. Whether it is appropriate for mountainous regions with difficult production conditions is the core question of this study.

2.3 Willingness to pay

In order to establish a fee-based advisory service in the mountainous and pre-mountainous regions of Tajikistan, it is crucial to find out how much to charge for the service (Dinar, 1996). While the sustainability of a public advisory service depends on the resources available to the state, the provision of a private service depends on functioning market mechanisms and thus on the farmers' willingness to pay (WTP) and capacity to pay (Ulimwengu, Sanyal, 2011). WTP is defined as the maximum amount a farmer is willing to pay for a specific service. The WTP is a priori unknown but can be estimated directly or indirectly. While indirect methods try to judge potential buyers' WTP by observing their behaviour in related markets, direct methods determine WTP by means of surveys (Parry et al., 2007). In order to do the latter, researchers employ the Contingent Valuation Method (CVM). A well-designed contingent valuation survey describes both the problem a farmer is facing and the support an advisory service offers to address that problem (Carson, 2012). The survey thus introduces a hypothetical scenario describing the benefit to the farmer, who subsequently states the maximum price he would be willing to pay for such a service.

After confronting farmers with a hypothetical scenario and noting their respective WTP, it is correlated with other variables (e.g. plot size, age of farmer, etc.) in order to get an idea of the interdependencies at play. Studies from Uganda and Nepal have indicated, for example, its dependence on the prevalence of free extension services (Ulimwengu, Sanyal, 2011).

14 Key concepts

Criticism of the CVM methodology focuses on three different biases that are a direct result of the survey designs applied.

- Strategic bias: The respondent strategically adapts his WTP to achieve a certain outcome. For instance, the farmer understates his WTP, expecting it will lead to a lower price for the advisory service (Carson, 2001).
- Starting point bias: The respondent is influenced by the initial price given as an example in the survey. Respondents will tend to adapt their WTP to that initial price (Freeman, Myrick, 1986).
- Hypothetical bias: Researchers have found that respondents tend to overestimate their WTP when confronted with a scenario they do not perceive as realistic (Carson, 2012).

The above-mentioned biases can be mitigated by using a comprehensive questionnaire. Such a structured questionnaire was developed by the research team (chapter 3). Our survey carefully introduced the respondents to the scenario to control these biases. However, complete elimination of bias cannot be guaranteed.

3 Operationalization

This study was conducted over a period of 6 months, including the elaboration of the research design and the finalization of the report. The following specifies in depth the methods employed and sample selection. It further describes the data gathered and limitations encountered during data collection and details how the Contingent Valuation Method and Human Capacity Development were operationalized.

3.1 Method mix and key components

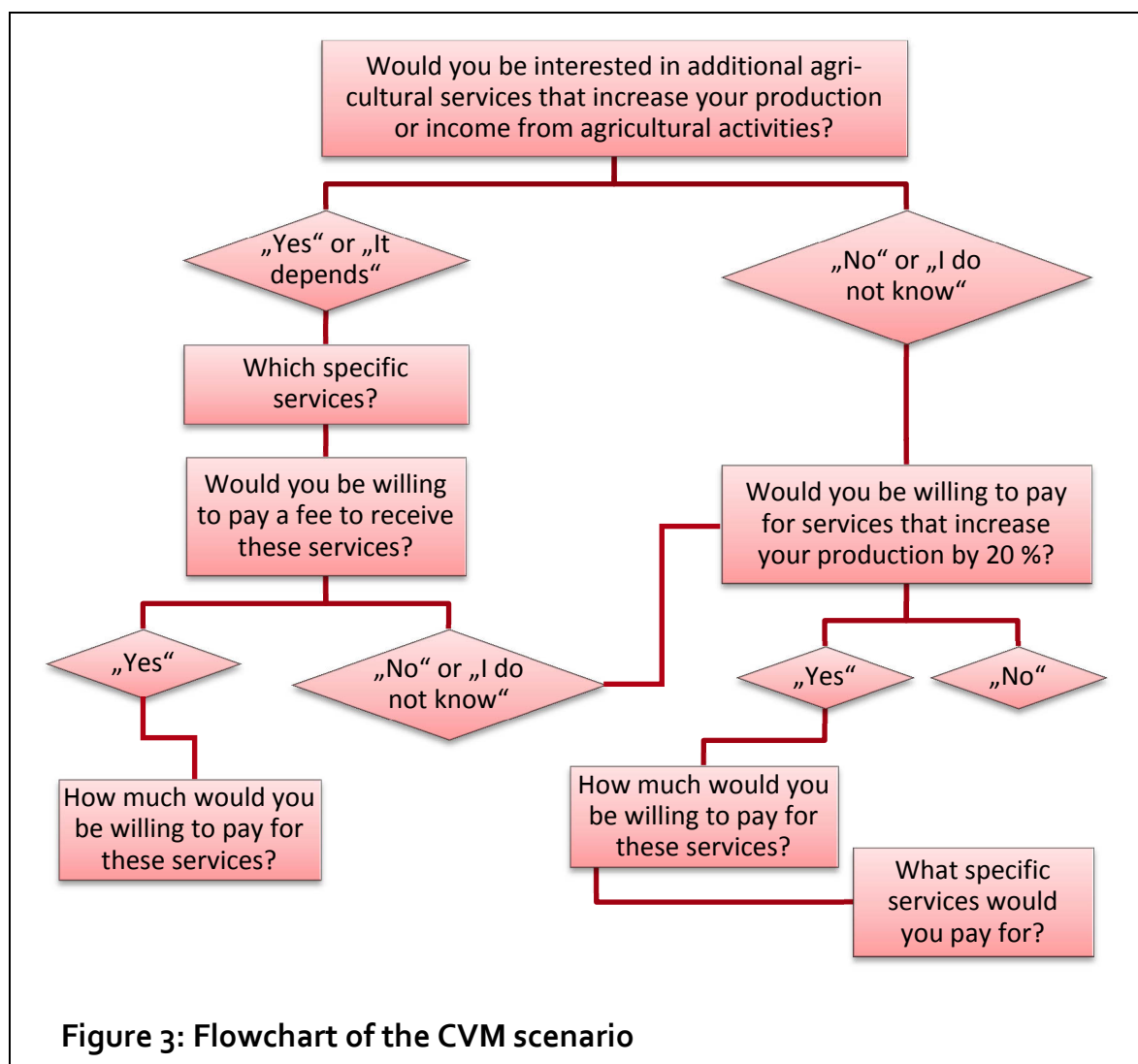
The team used a set of methods in order to collect qualitative and quantitative data. 130 structured individual interviews with farmers and 17 semi-structured interviews with agronomists consisting of open-ended and closed-ended questions as well as semi-structured interviews with experts and other stakeholders were conducted. In a second step, the team implemented 7 focus group discussions (FGDs) to verify and specify the information gathered during the interviews. Additionally, the study uses secondary data such as institutional reports and observations during the field visits and, where it was possible to obtain, statistical data. Preliminary findings were discussed and further elaborated with relevant stakeholders to ensure the applicability of the given recommendations (chapter 5). Triangulation of the different methods showed comparable results, indicating a consistent data collection.

Contingent Valuation Method

A central methodological component of the study is the Contingent Valuation Method (CVM), which was employed to estimate the willingness to pay (WTP) for advisory services among farmers in the research areas (chapter 2.3). During the interviews, the questionnaire confronted farmers with two hypothetical scenarios (Figure 3). First, respondents were asked about their general interest in additional agricultural advisory services. If respondents were interested, they were asked to specify these services. Subsequently the question was posed of whether they would be willing to pay for these services (stated WTP) and they were asked to quantify that willingness. If respondents were not interested, not sure, or were interested but unable to quantify their WTP, they were asked for their WTP assuming that the advice would result in a 20 %⁷ yield increase. If the respondent

7 The 20 % yield increase was chosen as a reference, being the average yield increase achieved and recorded so far by Sarob clients in the lowlands.

specified a percentage of the increase rather than a value, the WTP was calculated using the gross income from crop production.



Human Capacity Development

A further central aim and output of the project is capacity development for young Tajik professionals. Presence-based competence development, involving counterparts from different institutions, supports individual learning and networking and is part of output 6 of the study (Annex 1). Assimilation of knowledge on how to conduct an action-oriented research project in an inter-disciplinary team adds a strong asset to their professional experience and will have a lasting effect on future research conducted in Tajikistan. The capacity development was achieved not only during a three-week joint preparation phase facilitated by the International Training Centre of the GIZ in Feldafing, Germany, but also through on-the-job training during the research phase in Tajikistan. Especially during the elaboration of questionnaires, the execution of interviews and the discussion of

the results, the Tajik-German cooperation was essential and fruitful. The results presented in this report draw heavily on the experiences of the bilateral team.

3.2 Sample selection

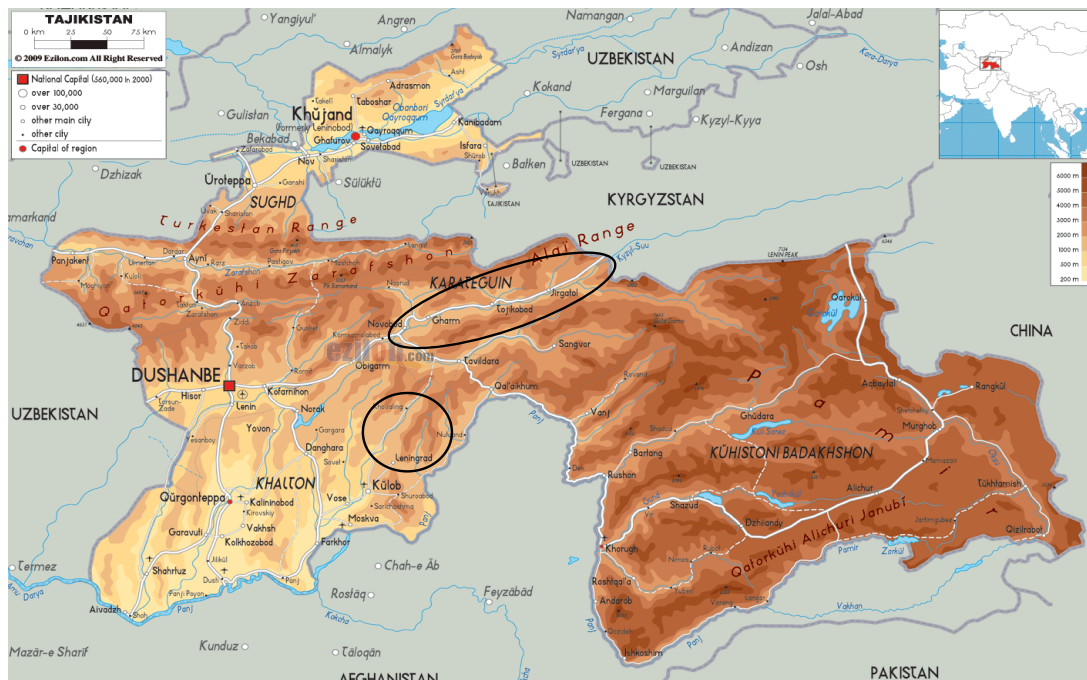


Figure 4: Research areas

Source: Ezilon.com, <http://www.ezilon.com/maps/asia/tajikistan-physical-maps.html>

The team interviewed 67 individual Dehkan farmers (DF), 44 family DF, 17 collective DF and one agricultural enterprise (1 farmer gave no information). We conducted 86 interviews with farmers in Rasht valley and 44 interviews in Eastern Khatlon. 5 different Rayons (second-level administrative division of Tajikistan) were visited. These districts display regional differences in terms of market access and geo-climatic peculiarities. On arrival, the team selected different Jamoats (third-level administrative division of Tajikistan) in each Rayon by geographical characteristics. Only Dehkan farms, i.e. commercially registered farmers, were interviewed. The interviews were conducted between the 18th of August and the 11th of September 2014 mainly in Tajik and partly in Russian.

Interviews with agronomists as well as focus group discussions took place in the same Rayons as interviews with farmers. All agronomists currently or previously affiliated to Sarob that could be identified in the research area were inter-

viewed as well as agronomists from the Hukumat (local administration). Expert interviews were mainly conducted in the capital Dushanbe with international organizations, financial institutions and other stakeholders⁸. Questionnaires are listed in the annex.

3.3 Scope of the study

Interviewing a fixed percentage of women farmers proved to be a challenge in the selection process. Even though the teams of interviewers were composed so as to be gender balanced and women-headed households were specifically targeted, only 8 % of the respondents were women. Planning of the survey had been based on a supplied figure of 60 % female-headed farms advised by Sarob, but this turned out to bear no relation to the real number of female-headed farming households encountered in the research region. A FGD with a local women's association was conducted to ensure a more appropriate analysis of women-specific issues with respect to agricultural advisory services. Furthermore, the identification of (former) paying and non-paying clients of Sarob agronomists was challenging mainly due to individual payment schemes.

The study further deals with sensitive information such as questions about income and land rights. The team took this into consideration during the elaboration of the questionnaires and the conducting of interviews, but answers may to some extent still be hypothetical. Furthermore, many respondents were not familiar with the financial details of their ventures, as accounting practices are not common. Scrutiny in the analysis of quantitative data was exerted and extreme outliers were excluded to account for these shortcomings. Crosschecks with secondary data were performed whenever feasible. However, the quality of secondary data is often questionable. Statistical data describing the socio-economic status quo in the researched Rayons was requested but not provided, despite multiple affirmative replies by decision makers in respective institutions. As soon as data from the national agricultural census is available in spring 2015, it can be utilized to further validate the findings of this research. Finally, a joint analysis and structuring of the report with the whole team served to overcome possible information losses during the translation process.

8 In the following, interviews with experts will be abbreviated "EXP" followed by the number of the respective interview. These numbers are listed in the references (Table 4). Similarly, focus group discussions are referred to with FGD and the respective number (Table 5).

4 Results

This section first presents an overview of the institutional framework and a basic description of the situation in crop production and advisory services encountered by the research team. After describing the estimates of willingness to pay, factors influencing WTP and potential alternative approaches to service provision will be discussed. All sub-chapters look at consequences of the status quo on a fee-based advisory system such as Sarob.

4.1 Institutional framework

Tajikistan has adopted a number of laws to foster agricultural growth and rural development. In the following sub-chapters the institutional framework in relation to advisory services is discussed.

4.1.1 Government, agriculture and advisory services

Government reforms, e.g. concentrating the sectors of agriculture, water, land use, forestry, natural resource, hunting and fisheries under one department, are meant to lead to better coordination and food independence (Exp7). However, the status of reforms and their implementation often remains unclear, as many actors and interest groups within the national, regional and local levels of government as well as international organisations and their agendas are involved (Exp2; chapter 4.1.2). Slow implementation, limited transparency and differences in interpretation of reforms result in a certain level of mistrust in (local) government which hinders investment and business development (Exp6, 12).

The government has plans to boost value chains by the installation of (cold) storage facilities (Exp1), as well as ideas about strengthening the public sector (Exp22). But with the Ministry of Agriculture only receiving 2 % of the national budget it cannot currently sustain a functioning, relevant and decentralized advisory service with a strong field presence (Exp1). A public advisory system down to the level of the *Jamoats*⁹ is planned (Exp1) but lacks all the necessary resources (Exp25). Consequently, the capacities and role of *Hukumat*¹⁰ and, where present, *Jamoat* advisors are limited to collecting information, and farmers say they have low expectations of the public system: *"I expect no help from government agrono-*

⁹ Third-level administrative divisions

¹⁰ Local administration

mists, they cannot solve the problems". On the other hand advisors provide advice on types and quantities of crops to grow (Exp13, 38), advice often perceived as an order. *"The Rayon advises me what to grow. I have to grow 30 % potatoes, the rest I decide on my own"* (Farmer interview). In the Jamoat Kalai Labio in Rasht valley, crops cultivated and yield have to be reported to the local authorities (Exp35). This again puts private advisors in a difficult position if they give advice about legal reforms and the best-adapted crops – and thus potentially against the 'recommendations' of local authorities (Exp26).

Experts and practitioners alike criticize the weak links between the education system, which fails to attract young people into agrarian studies, and the needs in the field – a lack of laboratories providing valid information on soils and fertilizer is frequently mentioned by farmers: *"If I send a sample of my soil to a lab in Dushanbe I spend 200 TJS just for the road and for food and maybe 100 more for the analysis – and then I'm still not sure whether they really analysed the soil or just tell me anything"* (Farmer interview). While universities are not perceived as teaching the appropriate agricultural knowledge (Exp9), the dissemination and implementation of the results of research is insufficient and data often remain unavailable (Exp14). Scientific knowledge of agriculture and responsiveness to modern developments is crucial for the agrarian sector in Tajikistan (Exp1), and some experts highlight the need for the government to find a way to make agriculture more attractive to young people by supporting commercial agriculture (Exp14).

Some initiatives to link academia and practice have been pursued, for example textbooks on good agricultural practices per crop developed in cooperation with the Tajik Agrarian University and funded by JICA (Exp17). Strengthening the pedagogical capacities of agronomists in their curriculum or providing training of trainers is, however, not sufficiently present on the agenda (Exp1).

Overall the institutional framework described above is not supportive of a private advisory system – but it is also not hindering the development of such a system. Limited capacities and willingness to invest in a public advisory system (Exp1) are among the main reasons to venture into private advisory systems. The existing systems – be they public, private or supported by international organizations – draw on the Soviet educational system, a model which no longer exists; for the future, education needs to be approached strategically.

4.1.2 Legal reforms

Legal reforms are a vital part of the institutional framework. They play an essential role in the development of a country, especially in relation to private sector development, as they ensure security for investors and entrepreneurs. Appropriate legal reforms support sector development in a country and lead potentially to increased growth. In Tajikistan, reforms are only slowly being implemented as they are not necessarily a top priority (Exp2). There is little government investment in raising awareness of reforms (Exp22) and a lack of understanding and information prevails.

Land reform

The land reform resulted in a restructuring of farms from large to small plots. Prior to the reform, approximately 700 agricultural production units existed. Now there are more than 130000 individual and family Dehkan farms (Exp7). According to the Presidential Apparatus, the core aspects of the land reform are threefold. Firstly, the state remains owner of the land but the holder of the land certificate has the right to either use the land or to sell the certificate. Secondly, the land title can be used as collateral to obtain a loan. Thirdly, a market mechanism for land-use rights is in the process of being established (Exp7).

Even though some farmers consider individual ownership of land as a positive development, both the implementation and interpretation of the law raise several challenges. Many farmers are not fully aware of their land rights. Although 50 % of the farmers acknowledge that they are allowed to pass on land to their children, only 21 % are aware of their right to sell their land certificate. This finding indicates that the establishment of a market mechanism to trade land use rights is still in its infancy. This problem is compounded by bank representatives, who stress that banks do not accept land certificates as collateral (Exp15).

Expropriation by the government, however, is the exception rather than the rule. 82 % of the farmers interviewed have not heard about the government expropriating farmers and the vast majority does not fear that their land could be taken away as long as it is used according to the law¹¹ and taxes are paid. However, 34 % stress that the decision to expropriate depends on the government. The reasons for the government to expropriate differ, ranging from road construction

11 The Land Code contains provisions that allow the government to expropriate farmers, inter alia, in case of non-use for two years or use of the land contrary to the use established in the use-rights document (USAID, 2010).

to non-compliance with certain cultivation targets: *"Normally they [Hukumat] say that they have to build a road or something similar and you are not allowed to say anything, you just have to accept it"*. Two farmers fear expropriation if they do not grow potatoes: *"The Hukumat representative comes and forces the farmers to grow potatoes. If we do not follow the order they will take our land."*

Next to land tenure insecurity, the unclear division of land and low perception of ownership constitute major challenges. In certain cases, the same plot of land was allocated to different families and competing claims resulted in court cases. With regard to ownership, land is often registered only to one person, although 9 people are actually making use of the land (FGD7). So far, the land reform neither grants the security needed for long-term investments in crop production nor does it provide incentives to invest. As a consequence, farmers tend to concentrate on preserving their livelihoods rather than working on strategies to develop them (Exp12).

The above results show that it is not only the implementation of the law that proves to be challenging, but also its interpretation. Some government officials are currently interpreting the right of alienation¹² as not being part of the land use rights. They have drafted a resolution that requires farmers to re-register their land rights in order to be able to buy, sell, lease or pass on the land title (USAID, 2014).

Agrarian reform

One of the core aspects of the agrarian reform is non-interference by local authorities in production decisions, namely the "freedom to farm". As in other former Soviet Union countries, freedom to farm used to be the exception rather than the rule: most of the farms were collective or state farms which were centrally organized.

The implementation of the reform has proven to be challenging (Exp7). While the majority of the farmers (76 %) decide either on their own or in agreement with their family which crops to grow, the decision of 8 % of the respondents is influenced by local authorities. Local authorities' interference in production decisions in the research areas differs considerably. In Rasht and Tajikabad, local authorities influence 13 % of the farmers' decisions on what to grow. However, informal talks with farmers seem to suggest that this figure is an underestimate. In Muminabad and Khovaling, the influence of the government is rather moderate (3 %). *"If I do*

12 The right of alienation includes inter alia rights to mortgage, buy, sell, lease, exchange or gift land rights.

not agree to grow potatoes or other products, then they [representatives of the local government] will speak to me" (Farmer interview). The Presidential Apparatus mentioned "food security" as a rationale behind the local authorities' intervention in production decisions (Exp7).

These findings on the agrarian reform suggest that there is a thin line between advice from local authorities and the imposition of explicit targets.

Pasture and water management

As pasture plays an important role in mountainous regions (chapter 2.1.2), the recently adopted pasture law also affects farmers in the research area. Pasture remains the property of the state and authorized state agencies allocate pasture user rights to herd owners. Part of the reform is a regulation on pasture user fees, which are collected in form of taxes (FGD7).

Water is a major challenge for farmers in the research regions (chapter 4.2). In particular, the lack of access to a reliable water supply constrains profitable farming. Access to water is managed by different actors, for instance by the government and water user associations¹³. The former recently reorganized the ministries in charge of water resources. Within the Ministry of Energy, the Department for Water Resources has been set up in order to handle the distribution of water. The department provides inter alia data on pumping stations and available pipes for the land plots. In order to achieve sustainable water management, an integrated approach with people's participation, e.g. through water user organisations, is essential.

4.1.3 Legal reforms and advisory services

The above-mentioned legal reforms are influencing agricultural production and are therefore also impacting Sarob's activities. Regarding the agrarian reform, some local authorities still influence farmers' decisions on what to grow. The land reform causes the work of agronomists to be more difficult as farmers have less land tenure security due to the unclear division of land and lack of ownership. As a result, farmers are reluctant to invest and, e.g. buy inputs, which are necessary to successfully implement an agronomist's advice. Establishing cooperation between Sarob and water user associations to overcome challenges related to access to water is currently difficult as the law on water user associations has not yet been

13 A water user association is a group of users who pool their resources for the operation and maintenance of a water system.

implemented. In conclusion, the institutional framework is not necessarily conducive for private agricultural advisors but neither does it inhibit advisory activities, and the ongoing reforms provide entry points for agricultural advisors.

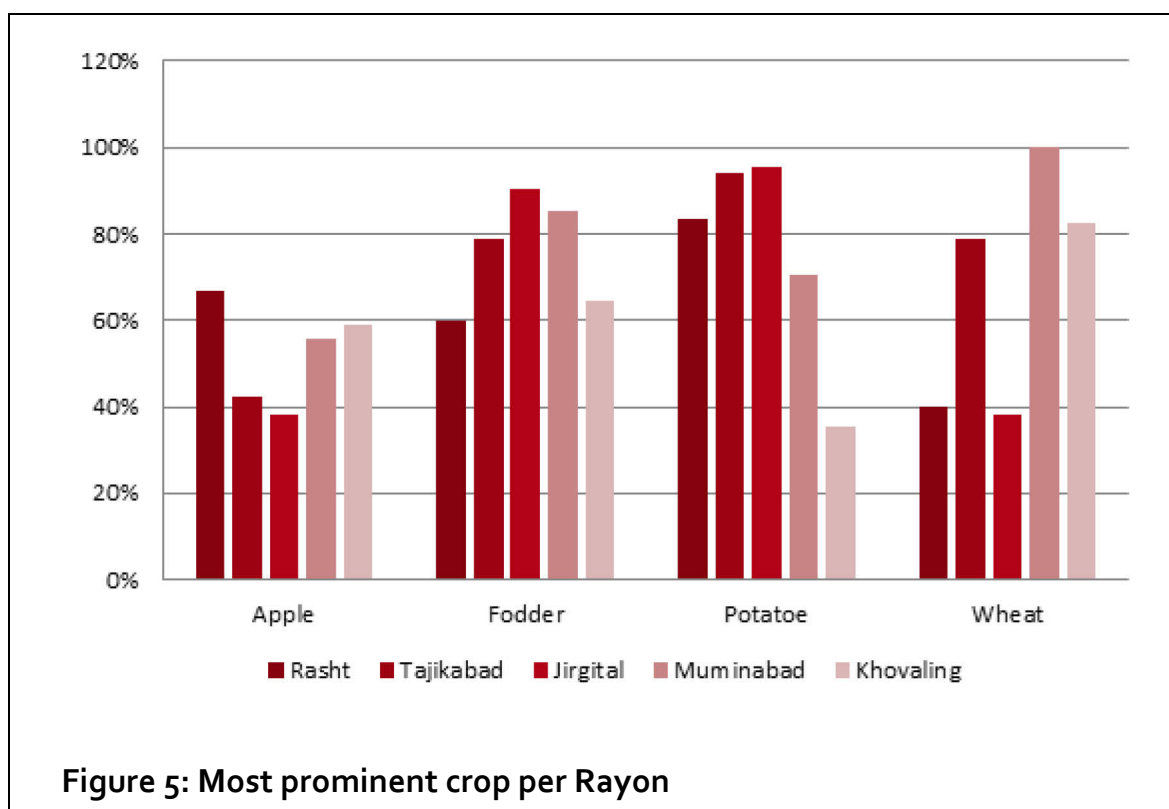
4.2 Agriculture in the research area

As highlighted in chapter 2.1, the livelihood of the mountain population is mainly based on mixed agro-pastoral systems with a tendency to diversify income through non-farm activities. These trends as well as the characteristics of the farming systems encountered are subsequently described in more detail for the commercial farmers interviewed. Main potentials and specific challenges for an intensification of agricultural production are highlighted.

Mountain crop production is of commercial value, but even those farmers who sell crops commercially need additional sources of income to sustain their livelihood. Small plots and low yields were emphasized as the main limitations on extending production. However, the importance of agriculture for food security and its contribution to a composite household income has to be stressed. The various potentials and challenges for intensification of production offer numerous fields of activity for advisory services.

4.2.1 Status quo in the research areas

Commercial farmers interviewed in the research areas grow primarily potatoes, diverse fodder crops (each grown by 76 % of farmers) and wheat (68 %). In addition, 52 % of farmers have recently invested in new, or exploit old, orchards – mainly apple – as an additional source of income. Besides the land used for cash and staple crops, all households cultivate mixed vegetables intensively on household plots rarely exceeding 0.4 ha. There is only one harvest a year, and long and snowy winters inhibit a more intensive utilisation of the land. Relevant differences in the production structure exist between the Rayons and even within Jamoats, highlighting the need for advisors familiar with the local context (Figure 5): In Khovaling, less than 40 % of respondents grow potatoes compared to 95 % in Jirgital and Tajikabad, in Muminabad, 100 % of farmers grow wheat (partly on rain fed land) whereas less than 40 % of respondents do so in Rasht and Jirgital. These differences are however not primarily dependent on location in pre-mountainous or mountainous areas but on a variety of factors such as availability of irrigated land per farming unit, functionality and amount of water supply, road access and frequency of traffic.



Respondents have an average plot size of 7.4 ha (median¹⁴ 2.9 ha) and an average irrigated plot size of 1.7 ha (median 1.2 ha). Potato is solely grown on irrigated land and occupies on average 0.8 ha, which represents nearly half of the more productive land. Wheat and fodder are grown on both irrigated and rain fed land. For those farmers who do grow these two crops, the average plot size is 2.3 ha for wheat and 3.2 ha for fodder.

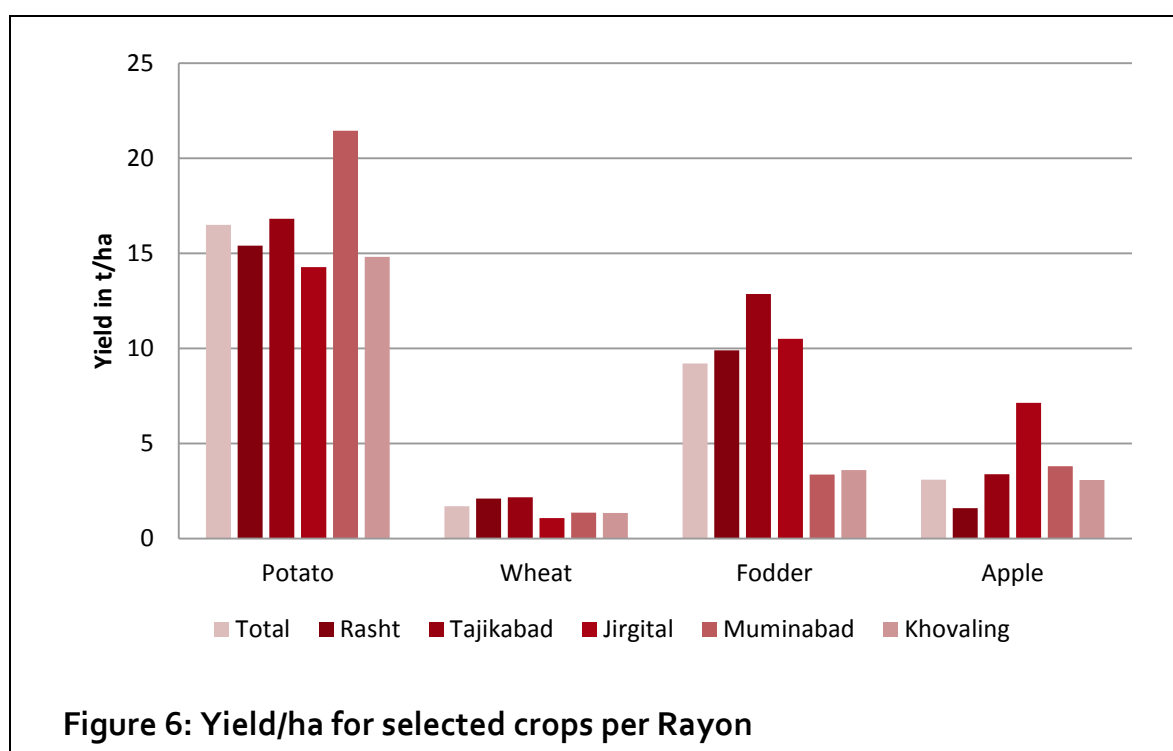
Interviewed farmers have been engaged in crop production for an average of 14 years and 93 % have unlimited land certificates securing their rights to work on the land and only 11 % rent additional land. The majority explain their choice of involvement in agriculture as resulting from a lack of satisfying alternatives and the need to generate additional income besides their pension or salaried work. Others mention family tradition or the desire to work the land. Some farmers started cultivating the land once they got a plot assigned in order not to lose their user rights (chapter 4.1) as well as to secure the survival of the family in the aftermath of the Civil War. Decisions related to crop production seem thus to be mainly taken by men, even in female-headed households – often, a relative of the ab-

¹⁴ The median is the numerical value separating the higher half of a data sample from the lower half. It is a robust way of representing a typical value for members of a statistical sample and can avoid distortions by exceptionally large or small values within the sample.

sent husband takes over the functions of decision maker, or the woman seeks telephone advice from the husband.

The average potato yield of respondents is 15.6 t/ha, which is far below international top producers (e.g. New Zealand with 50.2 t/ha) and – according to statements from respondents – below Soviet-era averages. However, yields are comparable to those obtained in similar geo-climatic conditions (Kyrgyzstan 15.9 t/ha, [Northern] Pakistan 19.9 t/ha; Food and Agriculture Organization of the United Nations, 2008). Yields for potato and wheat are fairly consistent across Rayons, with the exception of Muminabad which reported above average yields in 2013 (Figure 6).

Depending on the responding expert, potato and wheat yields are 30-50 % below the potential average if good agricultural practices were applied, i.e. an increase from 15.6 t/ha to a potential yield of 24-30 t/ha. Estimates for a potential increase of wheat yields range between 1.7 t/ha and 2.5 t/ha (Exp26; FGD6).

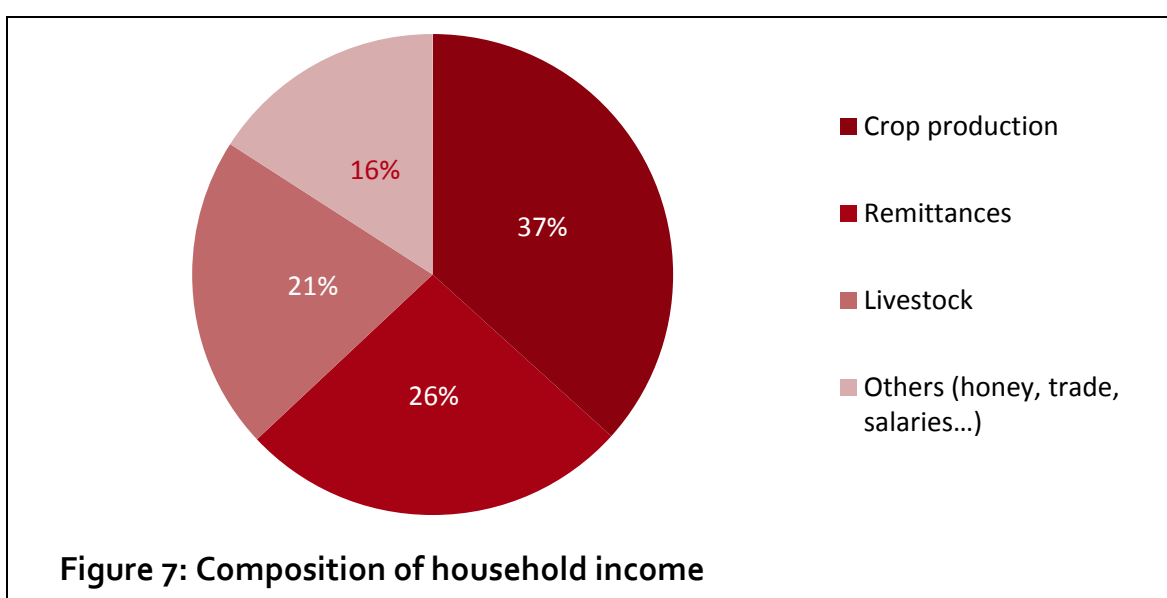


The commercial farmers interviewed utilize well over 50 % of their overall harvest for home consumption. Wheat (89 %) and fodder (98 %) are almost exclusively grown for subsistence and are yet often insufficient to cover households' needs for flour and animal fodder. 55 % of the potato harvest and 57 % of the apple harvest are sold, the rest is consumed at home or kept for the following year as seed material.

Composition of household income and importance of crop production

Across the whole research area, the interviewed farmers obtain 37 % of their income (198 US\$ or 990 TJS per month¹⁵) from crop production¹⁶. The fact that non-crop activities represent 63 % of their income even though they are commercial farmers hints at the limited capacity of crop production in mountain regions to fully supply household income needs. Remittances (26 %), livestock (21 %) and other income sources (honey production, commerce, salaried work with government institutions or temporary employment in construction, taxi driving, pensions – together 16 %) constitute the remainder of household incomes. Differences in household income between the Rayons occur, but the general pattern is of a mixed agro-pastoral livelihood with non-farming income sources constituting between 30-40 % of total income (Figure 7).

Remittances are mainly transferred from Russia. On average one person per household is working abroad, sending the equivalent of 138 US\$/month home. However, only 38 respondents confirm that they receive money transfers from Russia. This figure might understate the real value due to the sensitivity of the issue – this would explain why the reported average received by the respondents (over the total sample) is 50 % lower than estimates from other studies (around 340 US\$; Exp21).



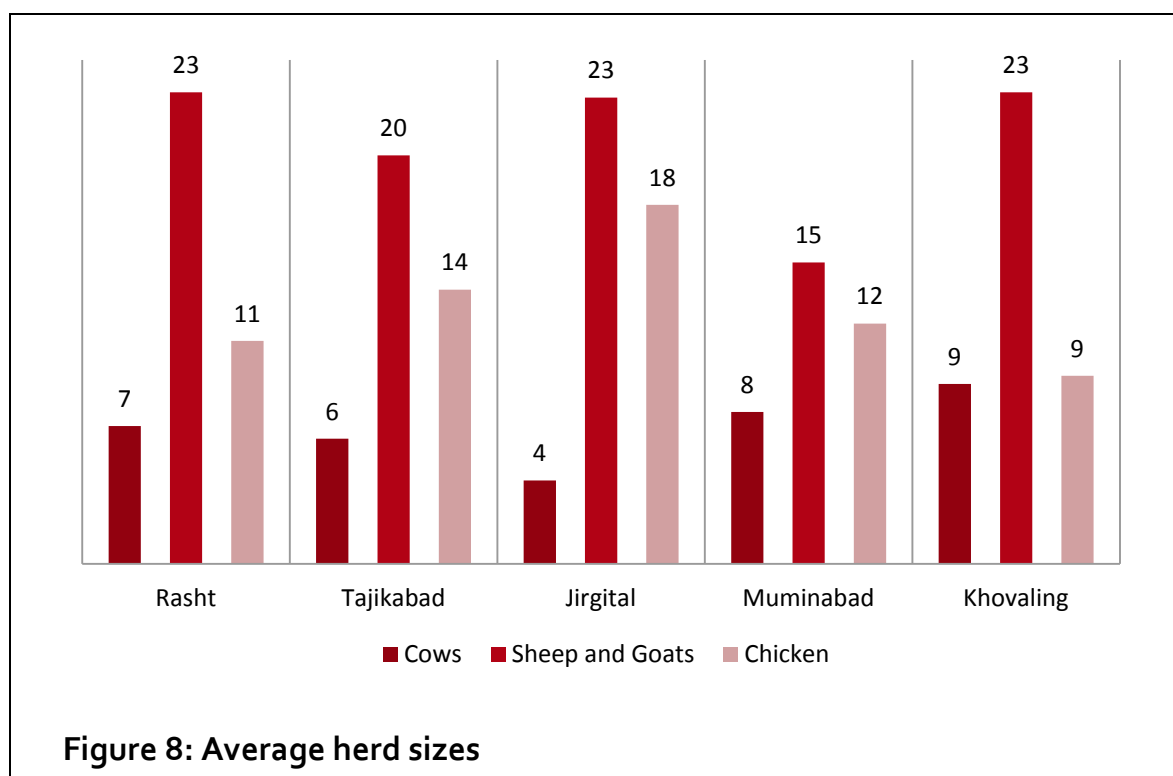
¹⁵ 5 Tajik Somoni (TJS) equal 1 US\$ (2014). Total average gross income of respondents was 2765 TJS/month, equalling approximately 550 US\$/month.

¹⁶ Gross income (2013) from crop production was calculated by multiplying the amount of crops sold by the price obtained per kg. Income from livestock is based on animals sold in 2013 and the prices obtained.

Livestock

Livestock represents an important additional source of income, with 97 % of respondents owning livestock. According to experts, it is overall the most important contributor to household income in mountainous regions (Exp7, 23). The average farmer owns 18 sheep or goats and between 6 and 7 cows and most keep them for home consumption of dairy products or meat and as standing capital. About 13 chickens are kept, usually for home consumption and for their eggs. Only a few respondents manage their animals as a business, buying them cheap in spring and fattening them in summer to resell them with a margin in autumn (Figure 8).

Many farmers grow winter fodder for their animals both on irrigated and non-irrigated land in order to reduce winter losses and maintain the productivity of the herds. Nevertheless, many have to purchase additional feed to bring them through the mountain winters, which can last up to six months. Other investments curtailing the further expansion of herds are veterinary services and payment for the shepherds. According to farmers, they are however willing to invest in their herds, as non-investments can lead to immediate loss of animals. The figures regarding livestock and monthly income show that the commercial farmers interviewed – i.e. potential clients of fee-based advisory services – are on average relatively wealthy when compared to the Tajik average.



The general increase of herd sizes, the decreasing transhumance radiuses as well as insufficient winter fodder impose limits on the potential for livestock productivity. Increased overgrazing of pastures (Exp12) is the main cause of underfed animals and low milk yields and leads to serious consequences such as soil erosion and increased risk of natural hazards. Cow dung is used for fuel and thus decreases the pressure on scarce renewable fuels (wood) – however its potential as organic fertilizer is lost (chapter 4.9).

Crop production is thus only one of three major contributors to household income. However, the importance of crop production for food security and the reduction of cash needs for the purchase of products is underlined by the results and stresses the importance of an agricultural advisory service.

4.2.2 Potentials

Given the relatively low yields it is obvious that the full potential for more intensive crop production is not yet being exploited. Various factors have to be taken into consideration to elaborate how a more intensive crop production can lead to sustainably higher profits.

As illustrated in Textbox 4, investing in existing crops (e.g. potatoes) is risky and of questionable benefit under current conditions. However, certain variables in the calculation could change the outcome:

- Higher selling prices for potatoes (not desired by the Tajik government and consumers as potato is a “strategic crop” for national food security)
- Access to higher-yielding and/or less expensive seeds (chapter 4.5)
- Alternative crops with high value or focus on forage crops like maize, tubers (sugar beet or others), oil crops, tobacco (chapter 4.6)
- Reduction of expenses by other production techniques (reducing use of pesticides/herbicides, water intake and machinery, zero/low tillage, agro-forestry, consistent crop rotation)

All these potentials represent entry points for agricultural advice and service. Some are already being explored by Sarob and other agencies working in agriculture, namely trials in potato seed multiplication – albeit with no convincing sustainable success so far.

Textbox 4: Investing in potato cultivation – is it worthwhile?

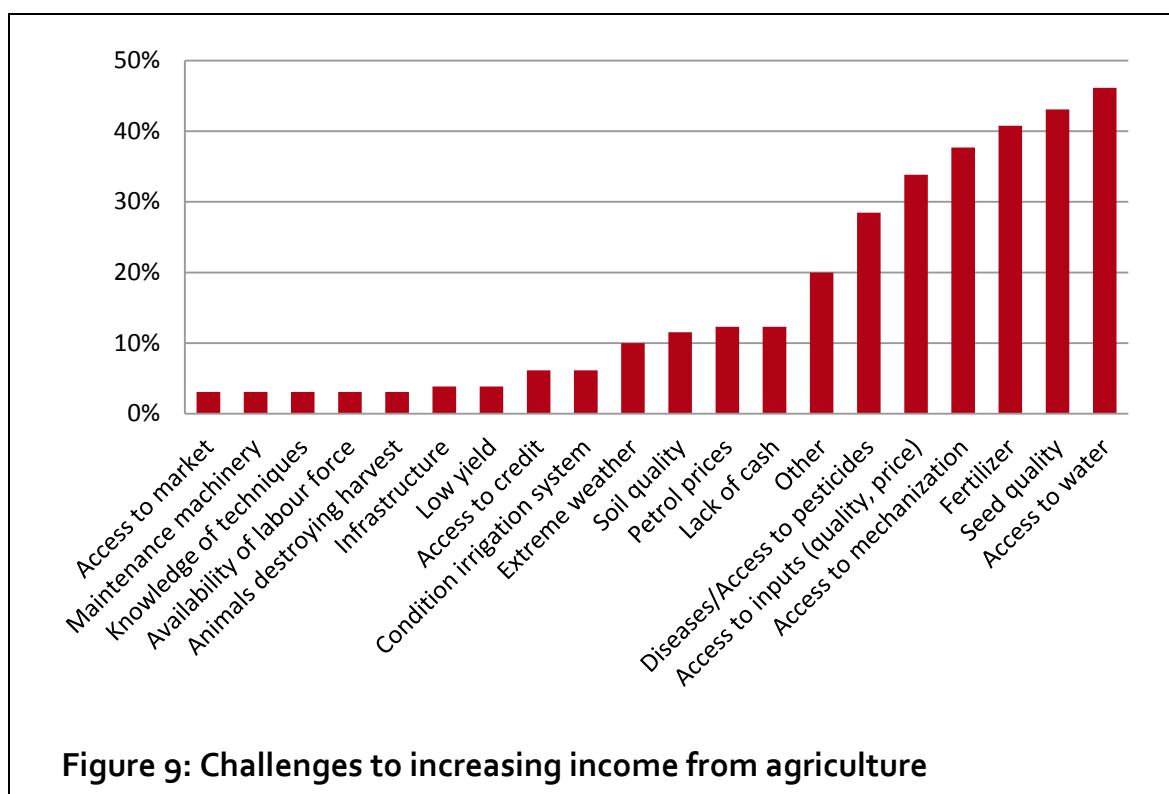
According to experts, the average potato yield could be raised from currently 15.6 t/ha to 24-30 t/ha. This would require an investment of approximately 19000 TJS/ha (~ 3800 US\$/ha), of which 75 % is for good potato seeds (4 TJS/kg) and 10 % for fertilizer. This amounts to (estimated) 9000 TJS/ha more investment than current expenses (utilization of own seeds worth 2 TJS/ha, half the amount spent on cheaper fertilizers and pesticides, standard price for water and machinery). At the average selling price in 2013 (1.47 TJS/kg), this yield increase would amount to a gross benefit of 11000 – 20000 TJS/year/ha or a net benefit of 2000-11000 TJS (~ 400-2200 US\$/year/ha).

The risks inherent to these investments (seed and fertilizer quality; bad weather; pests; decreasing soil productivity) combined with fluctuating sales prices result in uncertain and at best relatively low benefits from such investments.

The strategy of low investment as currently applied by farmers thus seems to be justified – as long as input prices and/or quality are not altered and other framework conditions are not improved.

4.2.3 Challenges to increased crop production

The most serious challenges affecting crop production raised by farmers are first the available quantity of water during certain periods of the year, closely followed by the availability of affordable quality seeds and fertilizers as well as of appropriate mechanisation. Thus, the most prominent challenges are all linked to inputs; availability, quality and price of water, seeds, fertilizers and pesticides are the most frequently named bottlenecks obstructing the intensification of production (Figure 9).



There is a general divergent assessment of challenges by experts and farmers. Many national and international experts mention access to markets, access to credits and a lack of knowledge as major issues (FGD7, Exp7, 28, 41). However, marketing of products does not seem to be a major problem to farmers (chapter 4.6). 15 % of respondents mention “lack of cash” as an issue, but “no access to credits” is only raised by 6 %. Credits seem to be available but not under interesting conditions for many farmers in mountain regions (chapter 4.7). Issues of land degradation frequently mentioned by experts (e.g. Exp12, 22) are not raised by farmers even if 15 % deplore the bad soil quality or low yields. Unfavourable business opportunities hindering the establishment of value chains (e.g. Exp6) are not seen as major problems by any interviewed farmer. Interestingly for the further discussion on advisory services, only 3 % of respondents mention insufficient knowledge of farming techniques as an obstacle to yield increase. On the contrary, many affirm that their knowledge exceeds that of many agronomists. According to farmers, this knowledge thus represents one of the major potentials for intensified crop production.

4.2.4 The significance of Sarob advisors

Mountain crop production is of importance both for food security and contribution to income generation. Despite all the challenges faced by mountain farmers, there are potentials that are not being fully exploited so far. The approach

pursued by Sarob to support specific crops and to overcome some of the major challenges correctly aims at valorising these potentials:

- The focus on yield increase for potatoes and orchards seems of primary importance for increasing the income of farmers and is at the base of any further considerations of downstream value chain development.
- Sarob's attempts to facilitate access to quality seeds through bulk orders issued by agronomists and through seed multiplication try to tackle one of the obstacles to improved production. However, the current provision and applied schemes have met neither farmers' nor implementers' expectations (chapter 4.5).
- Sarob initiatives to facilitate access to machinery aim to overcome the lack of appropriate machinery in the brief peak seasons in the mountains. However, the machines and equipment provided so far do not fully satisfy the needs of agronomists and farmers (chapter 4.5).

Mountain crop production is of definite commercial value, but even those farmers who cultivate commercially do not operate at maximum efficiency. Advice and investment can thus improve the livelihood of commercial farmers, if properly applied. The remainder of the study will examine how this can be implemented.

4.3 Advisory services

Currently, three main actors provide advisory services in Tajikistan: the government, international organizations and the private sector, including the entrepreneurial advisors who are members of Sarob (chapter 2.2). Different international organisations are currently developing extension models for various regions of the country. These models take mainly group-based approaches (Exp1). The target groups of these advisory systems range from subsistence farmers to bigger, more commercially oriented farmers (*ibid.*). Donor organizations often combine training with the distribution of machinery and inputs such as potato or vegetable seeds. Farmers receive these items either free of charge or at a subsidized price as the donor organizations usually cover (part of) the costs (Exp24). A common system for potato seed distribution is the provision of seeds under the condition of returning a greater amount of seed after harvest.

Governmental agronomists, mainly working within the Hukumat, collect information and advise farmers on various topics. They are further supposed to

conduct soil analysis for improved production (Exp13). According to experts, value chain approaches are not part of governmental activities, but play an important role in the strategies of international organisations (Exp1). Besides international organizations and the government, entrepreneurial advisors are gaining importance in the advisory system landscape of Tajikistan. The team mainly interviewed current or former Sarob agronomists who, in line with the Sarob approach, advise predominantly through field visits.

4.3.1 Advisory system in the research areas

The following findings present the existing advisory system in the research area. They give insight into the current information system in the field, the content of advice and the methods used by agronomists to provide these services and advice. The payment scheme for services and the role of Sarob will complete the picture of the existing advisory system of individual agronomists.

Around 76 % of the farmers interviewed in the research areas receive agricultural advice. International organisations provide the majority of the advice given (48 %), 29 % of the farmers have received public advice and individual agronomists have consulted 19 % of respondents. Besides advisory services, farmers use other sources of information to stay up-to-date on agriculture-related topics. 16 % (multiple answers possible) mentioned TV as a source of information, 15 % are in contact with agronomists, 13 % attend agriculture related seminars and 12 % contact other farmers and neighbours in case of a specific question.

Agronomists mainly update their knowledge and receive further education through the provision of training by international organisations (Aga Khan Foundation, Caritas and CESVI). This includes training offered by Sarob. Furthermore, agronomists consult books and the internet to update their knowledge. For specific questions that arise, agronomists are in close contact with other agronomists. Three agronomists are still in contact with specialists working in the universities and consult them as well as literature for current queries. Only one agronomist indicated that he has never used additional information and his own knowledge was enough to respond to any question posed by farmers. Although international organisations as well as Sarob provide training for agronomists, the latter mentioned a need for further training in the fields of marketing and processing as well as on new crop varieties and technologies. General training is necessary on potatoes and orchards and should be constantly updated as new problems occur every season.

Agronomists provide verbal advice on various topics and crops such as potatoes, seed production, wheat, irrigation, pests and diseases, soil preparation, the effective use of inputs, storage, basic processing and marketing. In addition, pruning and spraying of orchards are conducted as services. In general, a high demand for advisory services was identified in the research areas, with 90 % of respondents interested in additional advisory services. Farmers are mainly interested in how to use fertilizers and pesticides (31 %), general advice (16 %), the provision of, and information on, potato seeds, and pruning (9 %, multiple answers possible). For farmers, good advice consists of up-to-date knowledge, regular field visits and precise and easily applicable recommendations. Farmers who were not satisfied with the advice they had received criticised it for being too theoretical and the agronomists' knowledge as out-dated.

Methods applied

Agronomists advise in different ways in the research areas. The main methods, however, consist of direct field visits and advising via mobile phone calls. Based on the statements of agronomists, field visits are convenient both for agronomists and for farmers as they allow the agronomists to identify problems and farmers to better understand the advice given. However, field visits are time-consuming and incur transportation costs. Advice via mobile phone is considered to be efficient when dealing with farmers in more remote areas.

The frequency of advice given by the agronomists interviewed varies and does not follow a specific pattern. Some agronomists visit the farms regularly once a week, others on demand. Criteria influencing the frequency of advice are distance and size of farms, crops grown as well as farmers' level of knowledge and the resulting demand for advice.

The methods applied are crop charts and demonstration plots. The study team took into consideration the option of group advice to reduce farmers' individual costs, and included it in the research concept as an alternative approach for advisory services. Farmers and agronomists, however, consider mainly individual advice as the more appropriate method. It is effective and more suitable for addressing specific issues despite being more expensive. Nevertheless, some also argued for group advice as an effective way of reaching more farmers and fostering exchange between different farmers. While group advice is most relevant to new farmers who need advice on general issues, experienced farmers are not interested in general advice and are therefore sceptical of group advice.

Agronomists visit the fields regularly to monitor progress. Yield increase, measured as a comparison of the yield prior to and after advice is the main indicator of successful advice. Agronomists claim that farmers are not always able or willing to implement the advice given. One farmer lamented *"the advice was good, but I need money to implement the advice. So it was no real help"*.

Gender aspects and women-oriented advisory approaches are considered to be important by different international organisations. In the field, however, these approaches do not seem to be essential. A FGD with women confirmed the findings from the interviews; the actors involved consider the advisory needs of women and men to be basically the same, *"There is no difference between male and female advice"* (FGD2). Nonetheless, decision-making structure on farms is generally based on the decisions made by men. Women see themselves as implementers of the decisions taken by men (FGD2). According to women, even the absence of men in female-headed households does not influence the need for, or the approach to, advice.

Payment system

As described previously, fee-based advisory systems are not common in Tajikistan. Individual agronomists, some of them members of Sarob, do however charge for their services. The cost of the advice depends on the agronomist, the respective agreement between farmer and agronomist, as well as the service provided. General advice was reported to cost around 100 TJS per ha per season. However, some agronomists charge 100 TJS per month or 100 TJS per year as a fixed subscription. Additional services provided by the agronomists are pruning and spraying, which are easier to charge for compared to verbal advice. Pruning costs range between 1.5 and 20 TJS per tree for trees older than 15 years, spraying costs range from 1 to 3 TJS per tree. While farmers pay directly for pruning and spraying activities, general advice is usually paid for after harvest.

About 55 % of clients do not pay for the advice despite the agreements with agronomists. Others do pay, but not at the time agreed on. According to agronomists, farmers' payment problems are caused by unfavourable weather conditions, bad seed quality, high petrol prices or lack of water. Larger farms in particular have problems with payment, as the cost for advice generally increases with the number of hectares. Agronomists try to cover at least their expenses and are open to receiving payment in kind. They mentioned non-payment as one of the major challenges they face with regards to service provision. As a consequence of non-

payment, some agronomists do not return to the farmer to give advice. Many agronomists stated that there is nothing they can do if farmers do not pay.

Agronomists perceive the provision of advice as a profession rather than a vocation. They are motivated by the fact that they contribute to improved living standards of farmers. However, agronomists find it difficult to work solely as advisors as they face various challenges with respect to payment of the agreed fees which will be discussed in detail in chapter 4.4.

4.3.2 Sarob – Role and potential in the field

Out of 17 agronomists interviewed, 8 are members of Sarob, of whom two do not pay any membership fee. Three agronomists are former members and six are non-members. On average, the Sarob agronomists interviewed have been members of Sarob for 1.5 years. Knowledge of the Sarob system is mainly obtained through seminars in which Sarob presents itself as well as through implementing organisations in the field. Sarob conducts training courses for members and other agronomists on orchards, potatoes and seed multiplication, pest control and soil analysis, but also on communication with farmers and monitoring. Agronomists perceive a further need for training and services from Sarob in the area of machines and inputs (seeds, pumps for spraying, fertilizer). Furthermore, they are interested in an exchange with other parts of the country and their production methods.

A general advantage of a Sarob membership is seen in the dissemination of knowledge: *“information on innovations”, “exchange between agronomists”, “staying updated”, “possibility to ask questions”, “seminars”,* just to name a few. Further preferential access to machines and credits, subsidies and seminars on how to communicate with farmers are considered positive aspects of a membership. Disadvantages are high membership fees relative to income generated, time-consuming administration, and a lack of control over the activities of other agronomists influencing the farmers’ view on advisors in general.

Agronomists see a high potential for the further development of Sarob through more seminars, demo plots, input shops, financial support and as a provider of monetary advances for agronomists since their payment arrives mainly after harvest. Sarob is seen as a way of increasing farmers’ awareness of the profession of agronomists, which is not comprehensively present in the field. Generally agronomists seem to be satisfied with Sarob’s services but are irritated by the discontinuation of subsidies at the beginning of 2014 (see Textbox 1). They stated

that it came too early and was unexpected. Good support through Sarob would ensure quality services provided by agronomists, a crucial factor for the willingness to pay.

4.4 Willingness to pay for agricultural advisory services

The estimation of the willingness to pay (WTP) for agricultural services is an essential part of this study. The results show that the WTP is significant. This indicates the existence of a market for fee-based advisory services. The WTP is dependent on the tangibility of services, their quality and payoff as well as the share of crop production in the total household income of respondents. The method itself and its operationalization were introduced in chapters 2.3 and 3. This section reports the results of the estimation and explores their relation to other variables such as remittances.

Various interviewed experts doubt the feasibility of a fee-based advisory system in mountainous regions. This pessimism was also expressed by the participants in an initial workshop in Dushanbe (Exp1, 13, 36, 22). The doubts regarding a WTP sufficiently high to cover the operating costs of agronomists were threefold:

- The capacity and willingness to pay is not sufficient.
- The limited availability of inputs hampers the applicability of the given advice.
- Scepticism regarding yield increases could impede payment.

These three issues are given particular consideration in the remainder of this section and are contrasted with the views of both agronomists and farmers.

Farmers and agronomists are confident that the proposed system can function despite the fact that private agronomists, who charge for their services, face frequent payment problems (chapter 4.3). Asked about the general applicability of a system in which farmers pay the agronomist, 60 % of the respondents reported that such a system could work. However, the assertion was often conditional on the quality, tangibility and the payoff of the advice (in terms of income). Additionally, many farmers are not used to “paying for words”. They often know the agronomist from the former kolkhoz, when the agronomists were employees paid by the kolkhoz management rather than entrepreneurs. The capabilities of the advisor and the applicability of the advice are crucial in order to respond effectively to the existing demand.

4.4.1 Estimated willingness to pay

Table 1: Responses to questions regarding WTP

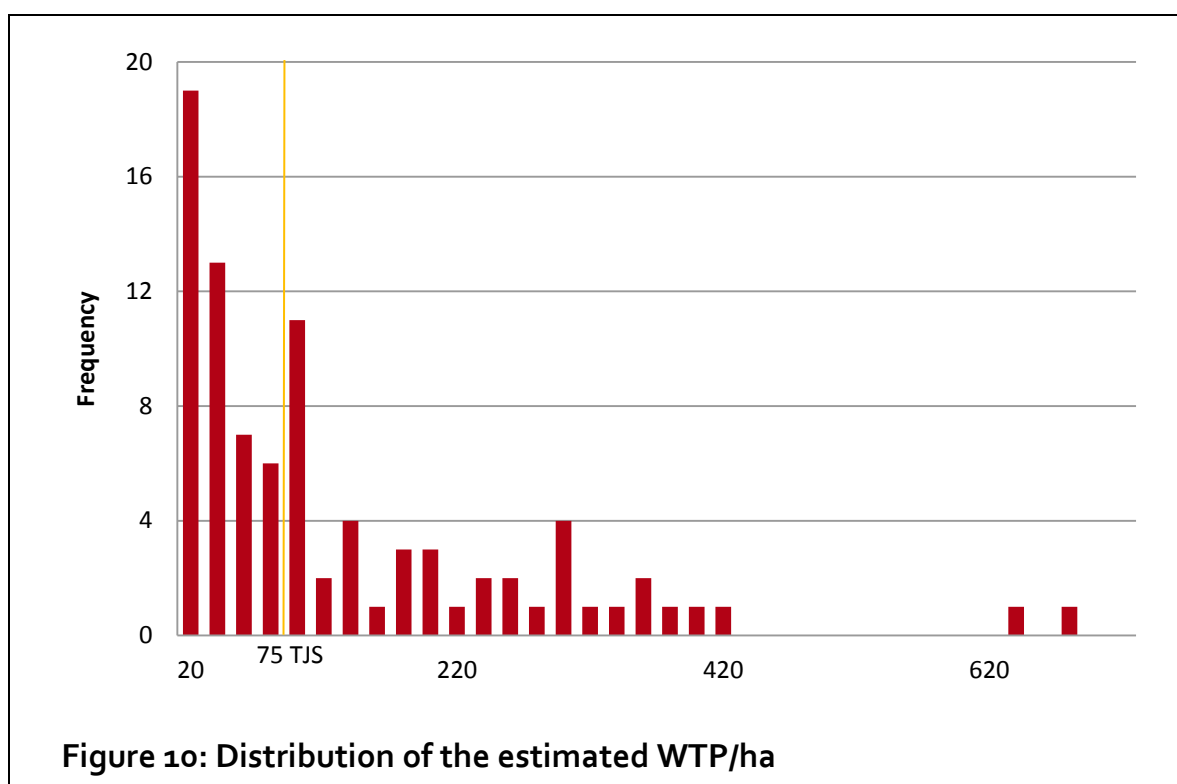
Respondents	Yes	Yes (%)	No	No (%)	Total
interested in advisory services	114	88	15	12	129
stated WTP in first question	81	69	36	31	117
able to quantify WTP in first question	49	42	68	58	117
quantified WTP in second question	55	89	7	11	62

Table 1 shows the sequence of questions and descriptive statistics of responses. Three results deserve special attention. Firstly, 88 % of the respondents are interested in additional agricultural services, which points to a potential market for agronomists. Secondly, whereas 69 % of those farmers stated that they were willing to pay a fee, only 42 % were able or willing to quantify their WTP¹⁷. Thirdly, 89 % of the respondents were willing to pay for advisory services if the service would result in a yield increase of 20 %. The difference between the scenarios may indicate that a majority of respondents are not convinced that a yield increase of that size would result from agricultural advice. If farmers considered a comparable yield increase to be a realistic result of advisory services, they would have quantified a similar WTP earlier. The latter is further substantiated by the fact that many respondents stress the importance of the quality of advice for a functioning fee-based system, an issue also raised by experts.

Even though only seven farmers were not willing to pay in any of the scenarios they were confronted with, the WTP was only calculated for 91 individuals due to missing data on the respondents' gross income. The estimates of WTP are distributed as follows: whereas 57 % of respondents say they would pay 200 TJS or less, only 18 % are willing to pay more than 500 TJS/season. The mean WTP is 455 TJS/season, whereas the median is 175 TJS/season. Due to this particular distribution, the mean WTP may overstate the actual WTP of most farmers and we prefer to interpret the median WTP (Figure 10). The median WTP/ha is 75 TJS, which is slightly below the price Sarob recommended to agronomists at the beginning of the project (100 TJS/ha, Exp20). The results suggest that the WTP of farmers for

¹⁷ This may indicate a bias (chapter 2.3) in the responses due to a lack of familiarity with the introduced scenario. Given intensive development interventions by international agencies and a "Soviet mind-set", attaching a value to advice may be difficult.

agricultural advice is slightly lower than that which Sarob recommended in the lowlands, but far more substantial than the interviewed experts assumed.



In order to evaluate the implication of a WTP of 75 TJS/ha, a hypothetical profit and loss account for an average agronomist was calculated (Annex6). In a genuine fee-based advisory system the advisors would be able to generate enough advisory revenues to cover their monthly expenses. We base the scenario on the average required income given by the questioned agronomists, approximately 1400 TJS/month. Assuming a fee of 75 TJS/ha, agronomists would be able to finance on average 46 % of their monthly expenses through advisory services. Under the same assumptions, full cost recovery would be achieved by charging a fee of ca. 122 TJS/ha, *ceteris paribus*. 36 % of respondents would be willing to pay more than 122 TJS/ha. In conclusion, agronomist cannot finance their entire livelihood through advisory services in present circumstances. Whether 36 % of all Dehkan farmers in the surrounding area represents enough clients (more than 52) for the agronomist may be assessed as soon as data from the new census are available.

To understand the diverse picture of the estimated WTP and identify possible entry points for Sarob, a more detailed analysis is required. Table 2 reports selected correlations of the estimated WTP. It is strongly positively correlated with the gross income from crop production ($r = 0.58$) and more weakly but still moderately with total income ($r=0.3$) and the share of income from crop production in total

income ($r = 0.32$). A similar picture emerges with respect to WTP per ha, though it is only weakly correlated with total income. Thus, rather than the importance of agriculture for the livelihood, it is the income from crop production itself that motivates respondents to pay for advisory services. The relatively low importance of total income indicates a limited propensity to cross-fund advisory services with other sources of income, such as remittances or salaried income. Accordingly, the WTP is only weakly positively ($r = 0.25$) correlated with remittances. Similarly, overall farm size is only marginally related to WTP ($r = 0.11$) while the size of irrigated land is strongly correlated ($r = 0.47$) with WTP. This finding is in line with the strong correlation with income from crop production; the demand for advice on rain-fed subsistence crops is considerably lower than the demand for advice on high value crops grown on irrigated land.

Table 2: Correlation of income and WTP

Correlation	Income from crop production	Income	Share of crop production
WTP	0.58	0.30	0.32
WTP/ha	0.39	0.14	0.31

In order to get a clearer understanding of the services demanded, respondents were asked which services they associate with their stated WTP. Over half of the respondents who specified a crop to be advised on mentioned potatoes (Table 3). Notably, less than 10 % of the respondents named wheat, though 67 % of all respondents do grow some wheat. Spraying services and advice on pesticides, provision of quality seeds, the use and timing of fertilizers and general advice on crop production are the most demanded services. In particular, the precise usage of fertilizers and pesticides seem to be a black box for farmers (chapter 4.5).

Table 3: Advices requested (crops)

Crop	Potato	Orchards	Wheat	Other	Total
Frequency	38	19	7	11	75
Per cent	50.67	25.33	9.33	14.67	100

The data highlight the existence of a market for fee-based advisory services. Income from crop production is the most relevant determinant influencing WTP. Most of the services demanded are in line with Sarob's training activities for agronomists. However, the estimated WTP is the result of a hypothetical scenario; the actual price is the result of individual bargaining between the agronomist and the farmers. Payment of this price will be analysed in the following section.

4.4.2 Challenges regarding payment for advisory services

The three major challenges for agronomists in requesting and receiving payment from farmers are the limited tangibility of results ("*not paying for words*"), doubts about the quality of advice/ yield increase and the unsuitable timing and regularity of advice.

Whereas specific services such as pruning or spraying of trees are paid by tree or by ha on the spot, demanding a payment for general advice and regular crop monitoring is more difficult (chapter 4.3). Often the advice is not interpreted as the decisive factor that led to a yield increase (Exp26, FGD1). Especially in results-based agreements, farmers have an incentive to attribute yield increases to other factors than the advice in order to avoid payment. Yield increases of 20 % or less are relatively easy to hide or explain away in order to avoid payment (Exp26). Furthermore, agronomists face a dilemma when their customers are reluctant to pay after harvest: social ties among the actors inhibit legal channels and make mutual trust the sole mechanism for guaranteeing payment. Also, the advisor may be required to extend his services out of courtesy, compromising the demand for payments from clients with kin connections in the tightly-knit social network. Nevertheless, many farmers made their WTP conditional on improvements attributed to the advice: "*If I see the result, I will make the agronomist happy*". In particular, those who are not yet clients of an entrepreneurial advisor emphasized such results and demanded trust-based payment schemes.

Respondents are not convinced of the quality of advice given. Many stated that they are often as knowledgeable as the agronomists about agricultural production. Assuming that the agronomists affiliated to Sarob do possess a more extensive and sophisticated knowledge, the lack of conviction among their potential clients constitutes a problem. Limited trust in the methods of agronomists may also explain why some farmers do not follow the advice entirely, leading to sub-optimal yield increases and, again, to a lower level of trust in the advisors' abilities. Additionally, many agronomists cannot guarantee the regular field visits they had once envisioned due to the cost of those visits, and rely on phone calls instead. However, as the reservations about group-based advice also show (chapter 4.3), farmers want the advisors to visit their field and to develop solutions that match their specific needs. This reinforces the potential for an individual fee-based system.

Lack of trust in the quality of advice is often augmented by another crucial challenge to the functionality of the advisory system: the limited applicability of the advice. The inputs that farmers are advised to use may be unavailable (chapter 4.5.), limited possibilities for capitalizing on high quality products discourages in-

4.2 Results

tensification (chapter 4.6), and a (seasonal) lack of cash may inhibit crucial investments (chapter 4.7). All these factors constrain the applicability and therefore the usefulness of the advice offered. A WTP that is sufficiently high to sustain a fee-based advisory system is irrelevant if these factors are not satisfied. Conversely, WTP will only be sufficiently high if farmers are willing to invest in an increased crop production.

In summary, a market for fee-based advisory services is present in mountainous areas. In order to empower private agronomists to capture that market, advisors need to consider investments by the farmers which are related to the advice. This may increase the likelihood of repayment as well as the tangibility and applicability of the advice, which in turn increases customer satisfaction. As clearly shown in one of the focus group discussions and by the on-going construction boom, the propensity to invest is high in the research areas, specifically for fixed assets due to their tangibility and visibility (e.g. cars, houses, machines) rather than intangible ones such as agricultural advice (FGD6).

4.5 Role and potentials of inputs in agriculture

Inputs play an essential role in agriculture and thereby potentially in every type of advisory system linked to increased production. Our findings show that the provision of inputs is an important determinant of the farmers' willingness to pay for advisory services (chapter 4.4.1). At the same time, the main challenges to increasing agricultural production are input related, according to interviews with farmers. More than 50 % of the farmers indicate access to water, seed quality, fertilizer and access to mechanisation as the main bottlenecks obstructing an improved production. For more than 40 %, price, quality and access to inputs are a problem while 40 % of the respondents indicate diseases and pests as being among the major challenges (Figure 9, chapter 4.2).

Good quality inputs such as seeds and fertilizers are costly and often difficult to find on local markets. Water, as a major input, represents a big challenge, as its availability is seasonally limited in some areas and many farms are not connected to functioning irrigation systems. Access to mechanization is yet another obstacle to increasing income from production. Whereas during the Soviet era machinery services existed, service providers are now rare and the machines owned by the farmers are often old, in need of maintenance and lack spare parts.

Many international organizations and donors provide farmers with various inputs free of charge. As a result, the farmers' willingness to pay for inputs decreases and input suppliers find it more difficult to sell their products (Exp41).

4.5.1 Seeds

Seed quality and the cost of seeds in general but more specifically potato seeds pose a major challenge to farmers. Interviewees use low-quality potato seeds imported from Pakistan or re-use seeds from their own production. Since the quality of potato seeds declines with each year, farmers need to buy new seeds after two to three years, which increases their expenses (Exp26). Farmers require and demand good quality seeds, but sometimes the decisive factor is the cost of seeds. As a result, farmers tend to purchase either cheap seeds of low quality or use their own seeds. According to estimates, only 20 % of farmers use purchased potato seeds. Farmers in Tajikistan tend to optimize their expenses rather than focusing on strategies or innovations for maximizing profits (Exp26).

In order to provide farmers with good quality seeds, international organisations and NGOs have started various seed distribution and multiplication projects, so far without satisfying results. Caritas has worked on a credit-type approach by providing seeds to farmers, who at a later stage had to return either seeds or money to the organisation. Also Welthungerhilfe (German Agro Action) was previously engaged in a seed multiplication system as part of their food security interventions. However, the implementation of the programme proved to be difficult due to high transaction costs linked to the collection and distribution of the seeds to individual farmers. Furthermore, interest in this initiative on the farmers' side was rather low (Exp1). The provision of good quality seeds through multiplication proves challenging but is essential to facilitating production increases as a result of sound agronomic advice.

4.5.2 Fertilizer and pesticides

Fertilizers and pesticides are expensive and often of low quality. The price for fertilizer is more than double that of Kyrgyz fertilizer. This price discrepancy stems from high taxes and levies, creating a grey market for uncertified imported products, which are cheaper but also less reliable (Exp26). In Tajikistan a farmer has to invest 128 US\$ for fertilizer in order to harvest 20 tons of potatoes per ha. Organic fertilizer from livestock is more expensive, amounting to 200 US\$ (FGD1).

A further challenge comes from the lack of knowledge about, and access to, fertilizers and pesticides. Farmers do not know which product to buy and which product is the best available on the market. What is more, many farmers do not

know how to apply the product correctly. Agronomists are reluctant to provide advice on this since they cannot guarantee the quality of the inputs unless they are involved in choosing and buying well-known products. In some areas, such as the districts close to Muminabad, farmers have difficulties finding fertilizers and pesticides. One agronomist provided farmers with specific names of products to buy, which farmers were unable to find either on the local market or in Dushanbe.

4.5.3 Machinery

Machinery plays an important role in the maximisation of productive efficiency on farms. During harvest time, farmers have a high demand for renting tractors and harvesting machines at short notice. During these peak times, the demand for machines is higher than its supply. As a result, some farmers lose parts of their harvest (Exp26). Many farmers therefore lease machinery and would be willing to invest in machinery if they had more cash available (FGD4). An investment in both sowing and harvesting machines could be profitable for many farmers, as it would considerably reduce harvest and post-harvest losses. The costs of the investment would be quickly offset by the saved labour costs and the increased harvest. Nevertheless, experts find it difficult to convince farmers that machines and machine rings are profitable and manageable (Exp26). Considering the assessed plot sizes in mountainous regions of the country (chapter 4.2), it is important to identify the appropriate type of mechanisation to increase production most efficiently. For instance, in order for spraying machines to be profitable, at least one ha of land of a certain crop is needed (Exp26). The findings show that a higher level of machinery supplied can lead to improvements in agricultural production within mountainous regions but that cash shortages and the availability of adapted machinery pose problems.

4.5.4 Water

Nowadays more irrigated plots exist than in the past and farmers are more organized in terms of water sharing. For example, some regions have a schedule for the use of water (FGD4). However, for more than 60 % of the farmers, access to water and irrigation is among the main challenges to increasing income from production. *"I would purchase better inputs, but as I have insufficient water it's not worth the investment"* (Farmer interview).

Government officials are also aware of the limited access to water. In Muminabad local authorities discourage farmers from growing fodder and wheat on irrigated land. Farmers are advised instead to cultivate orchards and garden crops and grow fodder and wheat on rain-fed land (FGD1). Farmers also stress that water is scarce

and that there are too many people who need improved access to water. Many water pipelines and canals were not properly maintained during the Civil War and there is a widespread and strong need to renovate the old pipes, though this would be costly. Water pumps pose another challenge to irrigation. Many pumps need to be fixed and fields cannot be irrigated during electricity outages (Exp20).

International organizations, water user associations and farmers maintain channels and water pipes (FGD5). Some farmers pay a fee for the maintenance of the irrigation system. The amount of the charges depends on the distance from the water source. One farmer mentioned his need to irrigate his field about eight to nine times per season and that he pays 30 US\$ per ha and season. As well as a fee for the maintenance of irrigation systems, some farmers pay a water user fee. The fee depends on the area cultivated and the crop grown. An agronomist indicated that the water department charges him 12 US\$ per season for 0.2 ha of irrigated land that he uses for potatoes (FGD6). It is clear that a proper water management system would be costly but is a crucial prerequisite for investing in both agricultural inputs and services.

4.5.5 Entry points for Sarob

The above discussion suggests several entry points for Sarob and agronomists linked to Sarob to establish links between advice and the provision of services. Sarob's commercial department, which is in charge of imports, selling of equipment and seeds, aims at being a self-sufficient entity by the end of 2014 and at being known for the best quality machinery and seeds (Exp20).

- The provision of high quality seeds (potato and others) has good business potential, as such investment could increase yields by 30-50 % (chapter 4.2). Agronomists already demonstrate the benefits of such seeds to farmers in order to overcome the latter's reluctance to pay for and invest in good quality seeds.
- With regard to machinery, Sarob is currently looking for input suppliers of small machines suitable for mountain regions (Exp42).

4.6 Marketing and processing

A lack of marketing opportunities is among the challenges frequently mentioned by experts associated with the agricultural sector. This issue, however, is rarely raised in interviews, neither by farmers nor by agronomists (chapter 4.2). Marketing channels seem transparent and intact to farmers. However, certain factors

impede more profitable marketing options and diminish the negotiating power of producers:

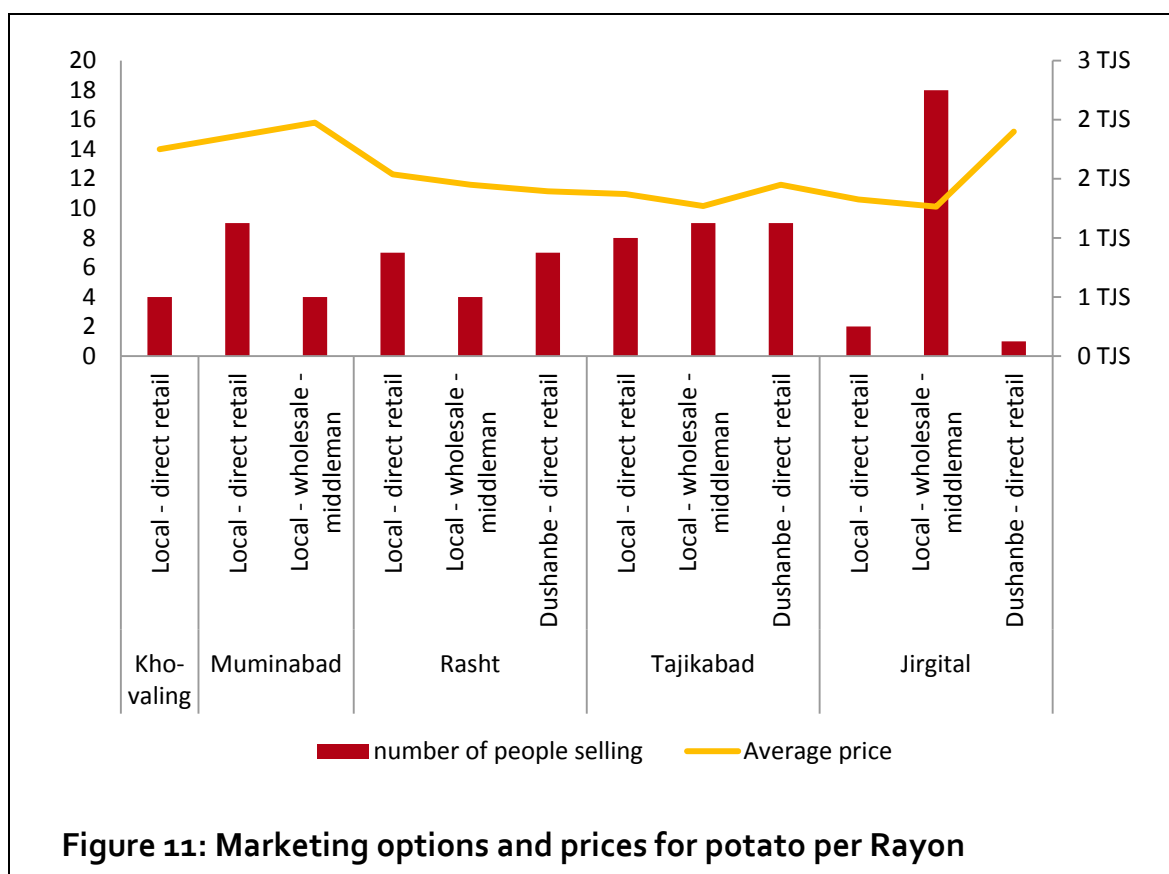
- Acute cash needs as well as limited storage facilities force farmers to sell immediately after harvest, when prices are low.
- Bad road quality/access spoils some of the more fragile goods (e.g. fruits).
- Limited numbers of processing facilities hamper value addition.

4.6.1 Status quo in the research area

Potato is the most relevant cash crop: 65 % of respondents sell potatoes, however wide variations between Rasht valley (77 %) and Eastern Khatlon (40 %) can be observed. According to farmers' statements, the marketing of potatoes and apples is no crucial problem. Marketing options include:

- direct retail sales from the farm gate or on the local market;
- wholesale to traders/middlemen, often combined with barter; and
- direct retail on central markets such as Dushanbe.

Most farmers take informed choices based on preferences, opportunities and needs. Interviewed farmers do not perceive traders as exploitative middlemen but as partners from whom they, too, can benefit. In Jirgital, the proximity to Kyrgyzstan facilitates trade. Traders buy wholesale and barter oil, salt, clothes and other commodities for potatoes – 18 out of 21 potato farmers sell or barter to middlemen. Rasht and Tajikabad have good access to roads so 64 % of farmers either sell by retail in Dushanbe if they find a truck to rent at an attractive price (0.2 TJS/kg) or to middlemen. 72 % of respondents prefer to sell by retail from the field or on local markets, a fact that could be attributed to poor roads in Eastern Khatlon (Figure 11).



The margin for direct marketing of potato in Dushanbe is biggest for Jirgital farmers, where farmers obtain 0.4 TJS/kg more compared to selling to middlemen. After accounting for opportunity costs, selling directly on a market is not more attractive than selling to a middleman. Farmers select the marketing channel according to their assessment of financial advantages based on their knowledge of market prices and on additional benefits (other business in town, availability of a vehicle) or labour force availability (time for sitting on the market). However, some also state that they are kept out of preferential market places by big traders, which renders direct marketing less profitable (FGD₄).

Furthermore, farmers' cash needs reduce their negotiating power on the market: As farmers derive one third of their income from crop production, harvest time is the period of major cash inflows (chapter 4.2). Autumn is also the time farmers repay debts, and purchase goods for winter (food provisions, fodder for livestock, home repair, heating material). This situation forces the respondents to sell quickly and at an unfavourable price. The lack of cash therefore impedes the realization of a greater margin and reduces the potential for capital accumulation, thereby impeding investments in the intensification of production.

Government institutions as well as national and international organisations engage in activities to strengthen marketing and processing. The government plans to close the gap between traders and producers by organizing regional retail markets but will most probably not focus on mountainous regions (Exp7). Various organizations have invested in storage and processing facilities (dairy products, preserves of vegetables) but with, at best, mixed results (FGD7, Exp6).

4.6.2 Potentials for marketing

Farmers, agronomists and experts alike praise the reputation of agricultural products from mountainous regions (apples, pears, potatoes, onions). The potential of meat, wool, leather and honey for income generation was also highlighted. In particular, many farmers have invested in the expansion and intensification of orchards in recent years (chapter 4.2).

Textbox 5: “Oyla”: processing and marketing of local products

The state-owned processing plant Oyla in Kulyob was privatized in 2003. The company now preserves and sells marinated local agricultural products. Successful management, financial and technical support for product development and the introduction of new packaging and processing technology has permitted the expansion of the facility.

Oyla first attempted to purchase products directly from farmers in order to avoid having to pay commission to middlemen. Despite agreements with farmers to provide certain quantities at a set price, the farmers often opted to sell on the market at a (temporarily) higher price: Short term benefits outweighed the interest in establishing long term partnerships. In consequence, Oyla was not able to acquire the minimum quantity of products necessary to run their machinery efficiently and provide merchants and markets with their products. As the direct provision of inputs has failed, Oyla now purchases in bulk from the regional market, claiming that producers are unreliable and only interested in short term profits.

But the reproaches are mutual: farmers (and agronomists) accuse Oyla of capitalizing on their (quasi-)monopoly power at the expense of farmers and of proposing too low a price for the products they promise to purchase. While the processor complains about unreliable producers, the producers speak of an unfair processor (Textbox based on Exp6, 29 and 10).

Private storage facilities with capacities of 3-8 tons exist on most farms and are mainly used for potatoes. An expansion of these could enable the farmers to obtain higher prices for their goods. As pointed out in interviews with farmers and experts, extensions of the existing facilities using local knowledge and the rehabilitation of Soviet storage infrastructure could be implemented with reasonable investments and boost local storage capacities, thus increasing the negotiating power of farmers (Exp26, 36). There are marketing potentials for niche and high value products such as herbs, onions and honey (Exp6) as well as innovative crops such as hybrid maize (Exp26). Provided that quality standards are met, Tajik agricultural and processed goods have a considerable potential for export to the Russian market, using historical and newly existing links through migrant workers (Exp8).

Ventures into processing by private entrepreneurs and farmers can build on existing preservation and processing practices and utilize knowledge often applied by women (conserves, wool, dairy). Sector experts highlight the importance of the introduction and enforcement of production standards for crops to allow manufacturing products of a consistent quality (Exp6) and thus to create employment and new income facilities.

4.6.3 Challenges in securing stable value chains

Several factors affect the competitiveness of products from the research regions on the national and international market:

- Quality of products: no standardized and reliable production
- Cost of products: high production cost (labour, inputs – chapter 4.5)
- Business climate: inconsistent implementation of government policies by regulating bodies discourages national and foreign investment (chapter 4.1)
- Cost of investment: high credit costs constitute an obstacle for entrepreneurs despite developments in the financial sector (chapter 4.7)
- Reliability: lack of trust within and between groups of stakeholders along the value chain – no strong and efficient business relationships (Textbox 5)
- Infrastructure: lack of reliable water and electricity supply diminishes processing (e.g. juice) and storage (e.g. dairy, meat) possibilities and product quality. Improving but still deficient road conditions increase transport costs and decrease product quality.

The intensity of donor activities in the aftermath of the Civil War alongside structural deficits stemming from the Soviet era pose obstacles to entrepreneurship as they affect inventiveness and business mentality (FGD7, Exp6). Mountainous regions in Tajikistan have traditionally been producers of primary products rather than processing centres. This has resulted in disadvantages in terms of facilities, market access and investment (FGD7). Last but not least, demand for Tajik products is limited – most customers seem to prefer imported goods because of their price, quality and reputation (Exp6).

This list of challenges identifies potential entry points for strengthening value chains. All of them require long term approaches, which are further discussed in chapter 5.

4.6.4 Links to advisory services

Despite the widespread lack of processing facilities, marketing channels for major agricultural products are in place and agronomists qualify as potential matchmaking agents between producers and processors due to their exposure to the network of producers in a district. So far, however, agronomists have been seen as “*plant doctors*” who are consulted when problems with the crops arise. Additional services with respect to processing are not in demand as they are beyond the traditional expertise of agronomists and thus seem beyond the imagination and capability of farmers and agronomists. Thus far, agronomists have not been involved in, and do not have particular experience of, marketing and processing. They do not perceive these activities as part of their role, and farmers do not request these sorts of services.

In order to play a role as intermediary between producers and processors, skills in communication and marketing are needed that the agronomists we met do not currently have. These skills are discussed in chapter 5.

4.7 Finance

This chapter introduces the status of the agriculture-related financial system in Tajikistan, the financial situations of agronomists and farmers in the research areas as well as challenges and potentials for cooperation with financial institutions.

4.7.1 Financial system

Microfinance institutions (MFIs) and formal banks are present in Tajikistan; the development of services, however, is still on-going. Most MFIs are not active all

over the country but focus on specific regions for their activities. Many MFIs are offshoots of former NGOs which might explain their concentration and strong involvement in rural areas (Exp3). The MFIs FINCA and Oxus¹⁸ only recently opened branches in Eastern Khatlon and plan to start operations in the Rasht valley in the future¹⁹. Banks are present in both areas and offer a wider array of financial services.

Competition is most pronounced in urban areas, as new entrants focus on these areas to economize on lower transaction costs and reach profitability quickly (Exp3). Interest rates amount to 20-35 % per year and have been rising over the last three years (NBT, 2014). As the sector has proven to be relatively stable, international and regional banks as well as MFIs are pushing themselves into the market (Exp15).

A general tendency from group-based lending towards individual lending is considered as a further indication of the professionalization of the sector (Exp3, 15). Nevertheless, financial literacy among farmers still constitutes a major obstacle (Exp21). The TAFF project (textbox 1), which was supported by the Frankfurt School of Finance and Management, aimed to tackle challenges inherent to the nascent private banking sector by offering technical assistance to various financial institutions regarding agricultural credit, including procedures to assess farmers' capacities for repayment (Exp39).

The financial system is characterized by short maturities, as many institutions rely on foreign funds due to a low saving ratio (Exp21). MFIs refer to this as a burden on interest rates as it increases the cost of capital, especially in local currency. Increasingly, credit is extended without collateral requirements, a trend that is attributed to competitive pressure (Exp3). However, repayment problems have not been reported so far (MIX Market, 2014)²⁰. Nonetheless, repayment is often financed through remittance transfers, which are an intrinsically unstable and insecure source of income (Exp26).

18 FINCA is a US-funded MFI and active worldwide. Oxus was registered in 2008 with the support of the NGO ACTED. Both are now among the six major MFIs in Tajikistan.

19 The number of MFIs in the research area was not assessed. However, besides First Microfinance Bank supported by AKDN, no MFIs seemed yet to be operating in the rayon centres of Rasht, Tajikabad and Jirgital.

20 $PAR_{30} < 1.5\%$; PAR_{30} = Portfolio at risk over 30 days: delays in repayment of more than 30 days. PAR_{30} is one of the performance indicators reflecting the stability of financial institutions or the financial system.

Generally speaking, finance is available in rural areas – often, however, under conditions that do not stimulate many farmers to demand credit (FGD6). This poses challenges to the fee-based advisory system but also presents potentials for cooperation between farmers and agronomists.

4.7.2 Financial challenges

Both farmers and agronomists suffer substantial systematic cash shortages. While only experts rather than farmers identify a general lack of cash as a challenge to agricultural production (chapter 4.2, Figure 9), seasonal pressures on cash flow are commonly observed.

As most farmers only harvest once a year, they face a long period of negative cash flows. The revenues from crop production accrue during harvest in autumn. Apart from this, the only agricultural income is the occasional sale of livestock and a first cut of fodder. This situation leads to a lack of cash for investment in agriculture when it is most needed. Inputs, such as fertilizers and pesticides, are bought in spring and summer during the earlier phases of cultivation. Even though 97 % of the respondents own livestock, animals are seen as an insurance for bad times (i.e. bad harvest) rather than as savings to be used for an “insecure” investment. Many farmers appear to lack the awareness of farm finances that would be necessary to manage cash more productively. As a result they avoid the cross-funding of crop production by other streams of income and forgo possibly efficient investments such as advisory services or high quality inputs (chapter 4.3).

All agronomists interviewed farm on their own and therefore have at least one alternative income source besides agricultural advisory services. Additionally, income from advisory services usually accrues after harvest, when their own fields are also generating revenues. Payments during the year are mainly received for tangible services like pruning and spraying (chapter 4.3). The seasonality of payments is especially problematic as prices for crops are low during harvest season and the common in-kind payments are therefore less profitable. As a consequence, it is difficult for agronomists to cover the variable costs of advice such as transportation that are incurred before harvest. Agronomists thus face cash flow problems similar to those of their clients.

The financial constraints described above form a genuine market for financial institutions and especially for MFIs, as the working capital of farmers and agronomists is rather small. However, farmers perceive various impediments to taking on credit for investments. Interest rates are comparably high and many requirements, such as the necessary documents, are difficult to obtain. Some farmers also re-

ported that payments under the table are common in financial institutions. In order to improve the investment climate, the latest amendment to the land reform gives land owners the right to sell the usage rights of their land, also qualifying it as collateral (chapter 4.1). But MFIs so far do not accept land titles as collateral (Exp3, 15), and only 40 % of respondents said that they are allowed to sell the certificate while 30 % specifically stressed that they are only allowed to pass it on to their children. The majority do not perceive their land title as an asset, and see no necessity to invest in it. As well as technical reasons, trust is another factor at play; people are insecure due to bad experiences during the Soviet era and the subsequent years of Civil War and crises in which savings were lost.

Limited financial planning and financial literacy are major constraints on investment in agricultural production. In addition, it is often not a rational decision to save money for the purpose of productive investments, as this increases the probability of being asked for financial support by members of the social network. This motivates the short term consumption of revenues and increases the propensity to invest in fixed assets rather than in agricultural production by the means of intangible advisory services (chapter 4.3).

4.7.3 Potentials for cooperation

The interviews and FGDs conducted hint at the mutual benefits of cooperation between financial institutions (especially MFIs), agronomists and farmers. Short-term cash needs form a potential market for financial institutions. MFIs have some experience with farmers as clients and agriculture is already a major part of their loan portfolios (Exp3). An optimized mixture of advice and investment can increase the productivity of agricultural land (chapter 4.2, 4.5). Furthermore, all agents share a similar goal or incentive, namely an increased yield for the farmer.

Financial literacy training, the involvement of agronomists in credit screening and agricultural advice as a part of improved Customer Relation Management were mentioned as potential additional services provided by agronomists and paid for by finance institutions (FGD3, Exp15). However, in such a model of payment for advice by MFIs, the agricultural advice may, yet again, be perceived as a 'free' service at the expense of the regular advisory business of an agronomist. Furthermore, many experts are sceptical of stronger involvement from agronomists in farmers' financial matters and of a direct link to MFIs. Advisors, according to an argument raised during workshops, have to retain their independence from MFIs in order to be trusted by farmers, and not serve the financial interests of the institutions or become liable for reimbursement or cash flows.

4.8 Role of community-based organizations

As discussed in previous chapters, individual fee-based advice in mountainous regions has proven to be only partially functional or even completely unsuccessful. An alternative approach could be based on grouping clients/farmers with the assistance of existing community-based organisations (CBOs) or their sub-structures, the result being a gradual installation of a cost-effective and thus more sustainable advisory system based on cost-sharing.

Since the 1990s, MSDSP has been organizing so called “village organisations” (VOs), which are usually based on local self-governance structures around the ‘Mahalla’ (a neighbourhood traditionally established around a mosque and providing the smallest social platform beyond the extended family). For example, all villages in Rasht valley apparently have VOs representing 80 % of the rural population. However, VOs are operational to varying degrees. According to expert estimates, only 30 % of the population use the platform as envisioned and promoted by MSDSP (FGD7).

Since 2008 VOs have been able to register with the Jamoat under the law of self-initiative and thus have access to a bank account and operate on another legal scale (The International Center for Not-for-Profit Law, 2014). VOs in Tajikistan are involved in different areas and are mostly financially supported by international organisations. Some examples of successful involvement of a VO (e.g. in the village of Askalon/ Rasht Valley) in supporting the community through the help of donors are: the building of new water pipes with the help of Welthungerhilfe (German Agro Action) and the provision of drinking water in the area by UNDP in cooperation with Mercy Corps (2007). Most notable is the construction of a new access road (financed by CIDA) and of a medical centre (financed by AKDN health services). For each activity, the VO organizes community contributions in the form of cash or labour. These activities do not so far include major involvements in agriculture. The surveyed VO in Askalon has recently registered as an NGO and has been able to apply for finances from International Organisations since 2013.

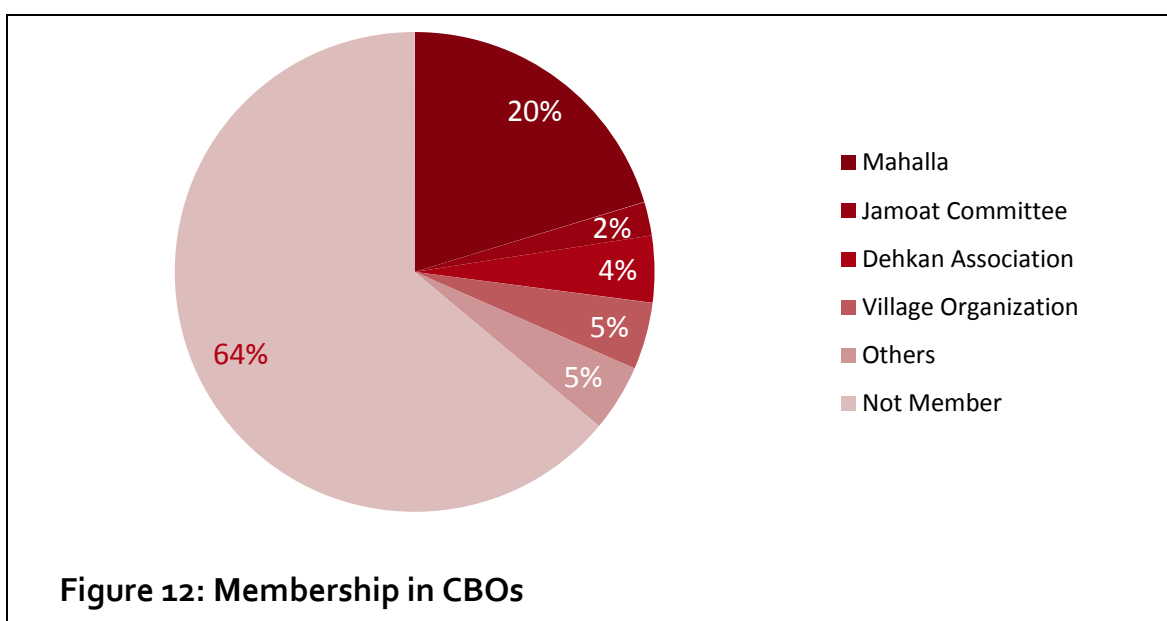
4.8.1 Village Organisations and advisory services in the research area

The role that respective VOs play in agriculture in the research areas and in advisory services depends on the commitment of farmers, the VO’s financial capacity and the surrounding local power structures. The study findings show that perceptions of the influence of the VO (Askalon) in addressing farmers’ difficulties differ substantially. The majority of the farmers interviewed state that the VO in their village has a minor (*“Normally they try to help farmers, e.g. through giving some*

good quality seeds to everyone, but they seldom reach all the farmers with their help") or even non-existent role in addressing farmers' problems. An additional substantial effort is required to strengthen VOs in general in order to enable them to play an influential role in supporting the establishment of a functioning advisory system.

As far as advisory services are concerned, the VO has not yet implemented any systematic support and sees itself more as a pool for information to be taken advantage of if needed. Nonetheless farmers mentioned that the VO is involved in coordinating the resolution of common problems, e.g. organizing the harvesting of the field of a deceased farmer or the leasing of a tractor for a group of farmers – *"If there are problems (...) the committee tries to support us by organizing group help for a single farmer (...)".*

In contrast to farmers' perception, the agronomists interviewed show a more positive perception of the influence of VOs on their work as advisors. They regard VOs as a hub for communication between farmers and agronomists, when promoting, for example, agronomists' services at the village level, providing orientation for the agronomist to find reliable clients and helping to claim fees. (FGD5). Membership in a VO or any local organization is generally very low: 64 % of the farmers interviewed are not members of any local organization (Figure 12).



Additionally, out of 38 farmers who are members of a local organization, only 7 are paying a membership-fee (18 %). The average paid membership fee is 26 TJS/ year. This stresses the financial dependence of VOs on other organisations; the fact that VOs cannot be completely (or even partially) supported by their mem-

bers results in an explicit need for financial support from local NGOs or international organisations. Regarding potential support for farmers, the VO (Askalon) does not have a sufficient budget to cover the costs of, for example, building a new storage unit for agricultural produce or buying machines to lease. It can organize the leasing (as it currently does), but cannot be involved in making any substantial investments – *“Without a budget, we cannot organise any storage facilities, nor cars for transportation etc. Maybe we can be a broker for the farmers when it comes to the leasing of tractors or selling potatoes, if we pool all the potatoes grown in the village we can fetch a better price (...) or be involved in sharing the transportation costs of our village (...)”* (FGD5). Without international organizations funding and implementing projects, the VO or ‘Mahalla’ social structure is mainly involved in organizing ‘Hasher’ (Tajik: ‘collective harvesting’), a form of informal community work done voluntarily to address prioritized temporary problems, for example the rehabilitation of a water catchment near a glacier installed during the Soviet era for provision of drinking water.

4.8.2 Potentials and challenges in supporting advisory services

VOs have the potential to be involved in several activities supporting an advisory system. Members of the VO in Askalon mention a potential for the following activities:

- organizing farmers’ groups/associations with “master farmers” (farmers that are more experienced and can share their agricultural knowledge with other farmers);
- coordinating input supply (including storage);
- coordinating the provision of services (timing of spraying, pruning, identifying diseases and pests etc.) in order to link agronomists with clients and negotiate prices for advice;
- organizing marketing activities and supporting value chain development (pooling yields and providing traders with larger quantities);
- sharing the transport costs of the agronomists and organizing groups to purchase and use machinery;
- helping to claim fees.

Preconditions for the applicability of these potential roles for the VO include a high quality of advice provided by the agronomists, as well as financial support for the VO.

As well as financial challenges, there are other challenges that hinder successful links between VOs and advisory services. Most crucial is the lack of trust between farmers. This explains why, for instance, the coordination of input supply appears to be so difficult; farmers are concerned that the person responsible for the purchase of seeds will not deliver the same quality for him as for others and therefore farmers want to be responsible for their own input provision (FGD5). For the same reason the coordination of services and collective purchase of machinery (linked to high investment costs) would prove difficult. In consequence, agronomists with a good knowledge of the capacities of VOs are less ambitious in their expectations of cooperation; as stated in workshops, they see the potential role of the VO (or its head) more in the introduction of agronomists to communities.

In conclusion, the findings show a great discrepancy between the statements of the VO regarding what it could imagine being involved in and what it would realistically be able to do. Nonetheless, the role VOs can play is not to be underestimated, as in mountainous regions they are an entry point for targeted support by international organizations (financial and non-financial) that could be linked more efficiently to advisory services and the farmers as its target group.

If VOs were involved in some of the above-mentioned activities that could be linked to fee-based advisory services, advisors could benefit from VO structures, whether or not they are members of Sarob. The agronomist could get in contact with respective VOs and, for example, arrange the sharing of transport costs for his services. Most importantly, Sarob could support advisors through word-of-mouth advertising disseminated through VOs to promote the benefits of qualified advisors and therefore of agricultural consultancies (FGD5).

4.9 Natural resource management and climate change

As introduced in chapter 2.1, the specific conditions of mountain agriculture pose particular challenges beyond those general to agricultural production, mainly climate change and the effective use of natural resources. These challenges influence agricultural production in the mid- and long term and are therefore taken into account in the assessment of the current advisory service.

4.9.1 Pressure on natural resources

Land resources play a crucial role in Tajikistan – *“Land resources have deteriorated substantially since independence due to the changed socio-economic conditions, which also entailed changes in land use systems”* (Exp2) and represent its main as-

set. Therefore, their efficient and sustainable use, which can be promoted by advisory services, is at the centre of economic development.

Additionally, the pressure on water resources is rising due to reduced water levels and deteriorating irrigation infrastructure (chapter 2.1, 4.5). In combination with increasing numbers of livestock, these issues lead to:

- decreased soil fertility due to insufficient crop rotation and intensive use of limited irrigated plots,
- increased pressure on and overuse of pasture land, causing soil degradation, and
- low productivity of livestock due to small pastures and limited fodder production.

With climate change (CC) likely to increase the prevalence of extreme weather events, farming will become a more risky business. Natural resource management (NRM) is therefore crucial to tackling these developments and ensuring sustainable socio-economic development in Tajikistan.

4.9.2 Climate change and disaster risk management

Tajikistan has been increasingly affected by droughts, floods and soil erosion caused by extreme weather and climate conditions coupled with limited national prediction and response capabilities (The World Bank, 2014). Degradation of land resources is reaching worrying levels; it is estimated that 90 % of rain-fed cropland, 60 % of irrigated cropland, and 90 % of pasture areas are showing signs of degradation (Shigaeva, Wolfgram, Dear, 2013). In addition, many see climate change as having a direct impact on the prevalence of natural disasters (The World Bank, 2014).

This study confirms these trends, for example finding a perceived increase in temperatures, leading generally to either a warmer (in already very warm areas) or a colder (in already very cold areas) climate, which not only influences agricultural production, but also increases exposure to, and the occurrence of, natural disasters. *"Some farmers settled in certain areas, but because of landslides they cannot cultivate the land at all"* (FGD7). Thus disaster risk management (DRM) continues to play an important role in ensuring the security of the population and economic growth in the country.

The above-mentioned issues open a discussion about future consideration of climate adaptation and disaster risk management through the inclusion of NRM in advisory services. The incorporation of advice and services that take into account

soil conservation, water management and sustainability (e.g. selection of seeds that are more resilient to climate extremes) are some examples.

4.9.3 Water and pasture management

When considering NRM in Tajikistan, the major priorities are water and pasture management. Statistics show that water sources are not a problem in Tajikistan (Tajikistan Water Supply and Sanitation Network, 2014). Access to water, however, (Figure 9) is the most crucial obstacle to increased agricultural production mentioned by the majority of farmers interviewed. Sustainable water use is therefore a crucial topic to be considered in the future in relation to NRM and advisory services. Many farmers in the research areas have insufficient irrigated land or do not possess any at all. Irrigation techniques have been mentioned as a topic farmers need advice on, as well as knowledge of crops that require less water and are more drought resistant (Exp12).

Pasture management and livestock play a big role in mountainous areas (chapter 2.1) *"If I had 15000 TJS to invest in something, I would invest them in livestock"* (FGD6). The quantity of livestock grazing on the same land has increased exponentially and the resulting pressure on pastures has led to a gradual worsening of the quality of pasture land and a reduction in its availability. Of the 4.1 million ha of agricultural land in Tajikistan 3.3 million ha account for permanent pasture while only 830000 ha are arable. Livestock production relies mainly on local grazing resources and forage production instead of a more intensive use of the available but often distant permanent pastures, which further increases the pressure on scarce arable land (The World Bank, 2014).

Opportunities for Sarob regarding livestock-related services can be identified in different areas, for example in promoting of the use of fodder plants (e.g. maize or legumes) as substitutes for, or in rotation with, potato or wheat to reduce pressure on pastures (FGD7). During the crop selection process, alfalfa and sainfoin²¹ could be promoted even for non-irrigated land, thereby contributing to soil conservation and soil enrichment. It should be kept in mind, however, that more forage could also tempt farmers to increase their herds, thereby achieving the counterproductive effect of increasing the number of livestock on pasture land already under pressure (FGD7).

21 Voluntary intake of sainfoin by cattle and sheep is 20 % higher than for grass, contributing to the fattening of animals and therefore their productivity.

Fertilizer and fuel play a big role in the productivity of land in agriculture. Deforestation and wind erosion as well as over-grazing are adversely affecting the productivity of pasture-land – *"Much of this degradation has occurred since the soil surveys were last up-dated. Improved soil maps would have the additional benefit of supporting technical advice to farmers"* (Exp12). The beneficial effects of manure for soil fertility are underexploited, as cow dung is currently used for fuel (FGD7). Instead, farmers have to purchase organic or chemical fertilizer to improve their soil quality.

4.9.4 Links to Sarob

Currently, NRM and climate change do not play a major role in the business model of Sarob. Their incorporation is to be seen as a potential for the development of a comprehensive advisory system. It is of course important that advisors not be overburdened with advice concerning public goods. The improved advisory system should first fulfil its main aim, which is to provide farmers with good advice that increases their agricultural production and to provide agronomists with a satisfactory income that covers their expenditures before incorporating NRM issues such as water management *"Advisory services will be important in the area of water management (...) water management is not part of people's normal thinking. In the current mind-set, there is plenty of water. To get people to pay for water will require subsidies for the next 10-15 years"* (Exp22).

5 Recommendations

A fee-based advisory system with high-quality agricultural services for mountainous regions is possible but can only be one component of a mixed supportive approach for the agricultural sector. Each component has to address the needs and capacities of the different target groups and different regional characteristics. Fee-based approaches are particularly challenging in a context where donors and international organizations offering services free of charge have a strong presence. Coordination of the different approaches is paramount to ensuring synergies and reducing competition.

The research team elaborated draft recommendations and discussed their applicability with programme representatives, managers, agronomists from Sarob and experts during the final presentation in Dushanbe. Some have already been piloted within the Sarob system but require a sustained effort to strengthen the relationships between farmers and agronomists. A strong commitment to expanding into mountainous regions is the basis for the following discussion, which differentiates between 'necessary' and 'optional', as well as 'short term' and 'long term' recommendations.

5.1 General recommendations

Strengthen the fee-based approach

Fee-based advisory services in mountainous regions have economic potential and need to be further promoted. There is a market for services of high quality and the willingness and capacity to pay for them is significant among farmers, provided they generate benefit (chapter 4.4). Motivated agronomists are ready to extend their private enterprise and wish to be supported to be better able to serve the needs and demands of clients (chapter 4.3). However, the business model needs to be adapted to guarantee the quality of services in mountainous areas.

Strengthen commitment and organizational standing of Sarob

This is a fundamental and necessary precondition to establishing a functional system. It includes the commitment to explore strategies that are especially valid in mountainous areas and to analyse existing approaches with respect to their applicability. The visibility of Sarob has to be strengthened, whether through regional representatives, a logo, information material, information sessions or other means.

The advantages of a local representative backstopping agronomists, monitoring the quality of services and creating links to other stakeholders in the region are manifold. They would assure the quality of services and a better adaptation and targeting of training, and contribute to the reputation of Sarob and its members. They would further be central in assuring the dissemination of information on the offers and services provided by Sarob to agronomists, farmers and other stakeholders. The costs of such focal points need to be taken into consideration and should, at least partly, be covered by the membership fee of the agronomists. The share of that contribution through membership fees should increase after an initial period of 3-5 years to allow agronomists to establish their businesses.

Focus on core business: yield increase

The primary task of agronomists – to ensure quality and quantity of production – should not be disregarded, but supported by further investigating better and more adapted training and the facilitation of input provision. Sarob is by now an experienced cooperative with an existing network of qualified agronomists and various approaches to input provision and distribution. As an organization it provides a good framework for individual entrepreneurs who have the necessary flexibility to cater to the needs of farmers with their diverse farming systems. Furthermore, Sarob as an organization could open additional pathways for other beneficial businesses in the long run – based on the interests, capacities and demands of involved stakeholders.

5.2 Recommendations – short term

This section describes activities Sarob should engage in to reach the short term objective: stabilization of the quality of advisory services and extension of their client base. A step-wise approach to broadening the scope of services offered by Sarob and, consequently, by agronomists should ensure that agronomists are not overburdened with tasks and do not lose their focus.

Extend and diversify training

Training on new techniques and updates on knowledge and practices are highly appreciated by agronomists. Training events are vehicles for promoting innovation, and the application of the knowledge acquired contributes to constantly improving the service agronomists offer, enabling them to strengthen their market position with respect to other agricultural advisors. Currently training focuses on core activities crucial for improved crop production. This offer should be broad-

ened in order to improve farmers' skills as economic entrepreneurs and to keep their knowledge of the changing legal framework up to date. In addition, Sarob should focus on improving the communication and pedagogical skills of advisors:

- New farming techniques and new crops; updates on new developments in the input sector, on low input techniques and the utilization of mini-machines. Training on these topics needs to be re-iterated regularly in line with innovations promoted by Sarob, e.g. on specific crops and machines made available at preferential conditions (see following section).
- Farm management – train agronomists to deal with the farm as an economic entity in order to give more coherent advice including cost-benefit analysis, book keeping and the planning of investments. This should include disclosing all costs linked to the advice given.
- Legal reforms – Because of their wide reach and their contacts with villages, agronomists are useful agents for disseminating current developments in the legal sphere concerning land rights and land use.
- Natural resource management – agronomists should promote resource-efficient, sustainable agricultural practices which, at a minimum, do not harm the environment – in particular when they are (even indirectly) supported by international organizations. The promotion of water-saving irrigation techniques, less water-intense crops as well as basic cropping techniques that contribute to combating erosion and preserving or improving soils should be developed and offered.
- Training of trainers – agronomists should be further instructed in up-to-date communication and advising methods to give them the ability to pass on their knowledge in the most appropriate way.

The above-mentioned areas of training help to ensure the quality of advice and the spread of innovations promoted by Sarob. They lay the foundations for a stable increase in production and are important to intensifying the relationship between Sarob and agronomists as well as to helping increase the visibility and reputation of Sarob.

Facilitate provision of external services

External services provided by agronomists and supported by Sarob open up opportunities for additional income sources for agronomists. As discussed earlier, farmers' demand for hands-on services and advice alone is not sufficient to seriously increase yields nor to generate sufficient income for the agronomists. Addi-

tional sources of income for specific services have already partly been identified (with more success in the lowlands) and need to be further exploited and explored:

Agricultural inputs:

- Facilitating access for farmers to high quality seeds, fertilizers and pesticides is necessary if agronomists linked to Sarob are to contribute to persistent yield increases (chapter 4.2, 4.5).
- The inputs (high-yielding varieties, certified pesticides and fertilizers) have to be promoted by agronomists with the help of demonstration plots sustained over several years to convince farmers of the added value of the (considerable) investments in better, certified inputs. Demonstration plots would contribute to building trust between the different stakeholders. Since experiences with potato demo-plots were mixed at best, new crops such as improved maize should be tried.
- The facilitation of input provision can occur through: a) establishing links to input suppliers such as SAS or other national suppliers; b) bulk provision of requested inputs through the Sarob commercial department; and c) seed multiplication. Each of these options implies challenges and needs to be carefully assessed. Based on the current state of information, we recommend strengthening the link to established suppliers, as seed multiplication and the import of specific inputs carry too many risks. Both have been tried, but with limited success.
- Sarob, on behalf of the agronomists, could negotiate a fee for linking farmers with suppliers of certified and quality inputs. Agronomists can physically distribute these inputs.
- The link to suppliers could evolve into a supplier-financed advisory service. It should be observed carefully to make sure that advisors affiliated to Sarob retain their independence and remain free to offer the best possible choices to farmers.
- Additionally, agronomists can further expand spraying and pest control services. Protective gear and health-conscious use of the products should be a core message of Sarob training.

Machinery:

- Facilitating access to machinery adapted to the particular conditions of mountainous regions and its farming systems represents another challenge, and cur-

rent production is less efficient than it could be with adapted machinery (chapter 4.5). Further promotion of machine rings (TAMs) is therefore necessary.

- The machines need to be small enough to be affordable, useful and resource-efficient on small plots. Multi-purpose machines with different supplements are available and are currently being explored by Sarob.
- Farmers need to be convinced of the value of the machines and the benefit they can generate. A system for promoting them has to be developed. Assuming that showrooms or machine fairs are too costly to organize, visits to farmers who use specific machines could be a strategy for promotion. Cooperation with financial institutions to organize machine fairs is another option for reducing expenses.
- Access to cash on preferential terms for investment in machinery is currently being negotiated with MFIs. Careful cost-benefit analysis needs to be carried out with interested farmers.
- Machines can be purchased by groups of farmers to share costs and multiply use. The challenges of communal maintenance and user rules need to be considered by the groups, a process that can be facilitated by agronomists.
- Agronomists should receive a commission for the promotion of machines – another extra service providing additional income.

Besides agricultural inputs and machinery, agronomists can expand their field of operation to other services related to crop production and explore them as additional sources of income. We consider these services optional, unlike the two above, which are necessary in order to increase production:

Services linking farmers to microfinance institutions:

- Besides the option mentioned earlier of credits for machine provision, agronomists should not be too closely linked to the financial sector, in order to maintain the trust of their clients and their independence as advisors. Screening of clients prior to a credit agreement or business monitoring for the MFI should be left to bank employees.
- Agronomists can, however, play a role in facilitating access to credit by disseminating information on the financial products of different available MFIs.
- They can further help farmers to develop their business plan and cost-benefit analysis such that farmers get a clear picture of the credit viability and repayment capacity of their farm. If such a pre-analysis carried out under the auspices of agronomists leads to a credit disbursement after a (faster) assessment

by loan officers, agronomists could receive part of the signing fee as a reward for their consulting. Loan officers and MFIs would remain the deciding entities, which would allow agronomists to retain their independence while earning an extra income.

Services related to NRM:

- As mentioned in the training section above, agronomists should provide advice in line with good practices for resource management leading to efficient and sustainable use of natural resources. Preservation of public goods would thus become part of their service portfolio.
- In order that agronomists be paid for these services, they need to produce measurable and observable results. These could include live fences around fields (for erosion control and construction wood as a value crop), specified numbers of drip irrigation systems installed by clients (water conservation), specified hectares of non-irrigated land being cultivated with legumes rather than ordinary grass (soil enrichment, soil stabilization, reduction of pressure on pasture).
- The offer of such services and the payment for them would depend on the initiative and capacities of individual agronomists. Payments for these services can be sought from organizations promoting NRM and disaster risk management.
- Sarob can support these initiatives by providing the training mentioned above and by establishing links to organizations working in NRM.

5.3 Recommendations – long term

In the long run, Sarob will need to explore options for diversifying the range of services it offers and seek cost-efficient models in order to fully respond to the potentials and needs of mountainous regions and reach financial sustainability. These options are partly extensions of short-term initiatives described above but also represent new business opportunities.

Expand into livestock management

Livestock management is economically interesting, as livestock is vital for land use and income generation in mountainous regions (chapter 2.1, 4.2). It would be a relevant contribution to NRM (chapter 4.9) and would (partly) address the same clients who demand advisory services on crop production. Farmers seem even

more willing to pay for livestock management (e.g. veterinary services) than for increasing their crop yields. The new pasture law introducing community pasture management opens the door to advisory and other support services.

However, livestock and pasture management is a different sector from crop production – Sarob would need to start up livestock-related advisory services. This would be a strategic decision with many implications. We recommend further exploring the option once time permits, considering the necessary effort and the focus on the first priority: stabilization of crop quality and increase of crop production.

Cooperate with CBOs on a trial basis

Cooperating with CBOs can reduce the price the individual pays for advisory services and thus open a new segment of a market where farmers formerly were not able or willing to pay for services. In addition, decision makers in CBOs can serve as entry points and support to agricultural advisors for the promotion of services and for the collection of fees. However, the research team assesses the current potential for cooperation with existing CBOs as limited (chapter 4.8).

We recommend therefore piloting such cooperation with interested agronomists. The precondition is the identification of a functioning CBO willing to cooperate even though it will not financially benefit from the cooperation. Entry points would be the head of the CBO as a ‘spokesman’ for the agronomists. The CBO should, in a first step, help coordinate farmers’ requests for services (cost sharing), and organize basic training in groups (general cultivation practices). At a later stage, when trust between agronomists and farmers as well as among the farmers regarding the benefits of cooperation is built, joint marketing of products, bulk provision of inputs or joint purchase of machinery could be envisioned.

Facilitate establishment of downstream value chains

The income potential of marketing and processing has to be valorised if crop production is to play an increasing role in the livelihood of the rural population. However, downstream value chains are currently weak (chapter 4.6) and the business climate is not conducive to substantial investments in the short run (ibid.). Most strategies for strengthening downstream value chains are beyond the capacities and mission of Sarob: altering trust between stakeholders, improving trade structures and influencing consumer preferences. An in-depth analysis of the strengths and weaknesses of existing value chains coupled with stakeholder dialogues, identification of change agents and the subsequent elaboration and implementation of a chain-upgrading strategy calls for a coordinated sector approach.

However, agronomists and Sarob could play a role as 'matchmakers' between production and processing. Advisors could organize groups of producers and/or collect products to provide processors with certain quantities, thereby helping to establish trust between the actors. A further step in such a processor-producer relationship could be a contribution to investment in higher-yielding seeds by the processor. The processor would pay for this service provided by the agronomist and thus encourage farmers to plant new varieties or intensify production. The reduced risk for the processor concerning the product he is expecting as well as the reduced transaction costs when gathering his inputs would justify such a fee.

Such engagements require trust and reliability. Stakeholder dialogues, possibly facilitated by Sarob, could lay the foundation for mutual agreements on quantities, quality, time and prices of the products to be traded. These agreements would have to be kept by both parties if a long-term, mutually beneficial relationship is to be established. Agronomists could then mediate the fulfilment of the agreement, provided they are trained in communication and negotiation.

5.4 Conclusion

Investing in fee-based advisory services in mountainous regions can be economically viable for Sarob and for agronomists. The short-term and long-term recommendations discussed in the preceding pages contribute to the establishment of Sarob as a brand delivering quality advice and services, which increase the income from crop production of their clients at a fair price. Time and constant support are needed to help establish these quality services and the links necessary for a functioning network of advisors. A gradual approach serves to empower the organization to support agronomists in gradually becoming successful entrepreneurs. The subsequent model summarizes and highlights the priorities and steps recommended by the study team based on the results of the research and discussions with decision makers within Sarob and the GIZ programme (Figure 13).

5.5 Generalisation

This study, like many others, focuses on specific regions and actors. It is thus important to discuss which results are generalisable to other countries and regions in order to contribute to the on-going debate on advisory services. As highlighted in chapter 2.2, identifying an appropriate agricultural advisory system for a region and making it work is a big challenge. Establishing a fee-based system in a disadvantaged part of a low-income country is thus an even bigger task.

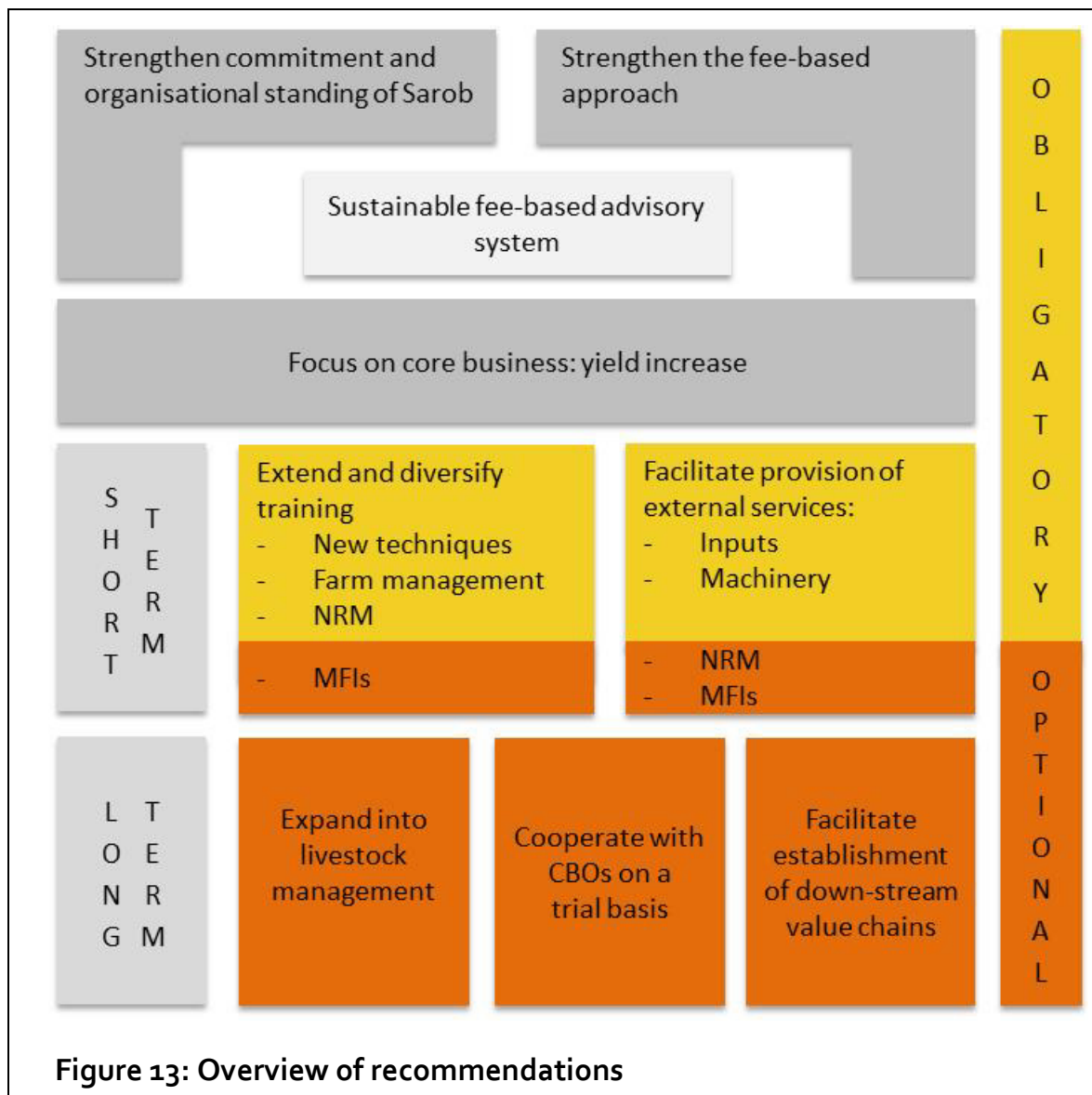


Figure 13: Overview of recommendations

The establishment of a fee-based system in mountainous regions in Tajikistan is taking place in the context of an already existing advisory business model, Sarob. This means that agronomists are already present in the field and often highly motivated to work further within the Sarob system, initiated and still supported by GIZ. In addition, agronomists have different sources of income and are thus not fully dependent on an income from advisory activities. Input suppliers for seeds, fertilizer, and machinery are also present in the country, which makes it easier to establish a system and creates opportunities for alternative and unexplored payment mechanisms for the fee-based system. All these are pre-conditions conducive to the establishment of a fee-based advisory system.

Factors decreasing the likelihood of substantial willingness to pay are the historical background (e.g. the free advice within the Soviet collectivised farming systems) and the strong presence of international development organisations. This presence is often counterproductive for the establishment of a fee-based approach through subsidized inputs and training. However, if the paid advisors offer convincing services leading to yield increases, farmers will still be willing to pay for them. Some general aspects are apparent:

- Even in a difficult production and infrastructure environment, commercial farmers are willing to pay. Even with mainly small plots and limited excess production, they produce (partly) for the market and are therefore a target group of a fee-based system. However, the approach does not focus on subsistence farmers and direct poverty reduction. Therefore, a mix of different advisory systems is necessary if poverty reduction is a direct objective.
- The willingness to pay is greatly dependent on the quality of advice, which depends on the training advisors receive. This is why an umbrella organisation is so important, for feeding the system with information and as a guarantor of quality.
- An organisational entity is also necessary, to coordinate agronomists, training and supporting structures in addition to the general advice.
- Cash flow problems for agronomists and farmers are likely to arise due to payment after harvest, especially in poor environments. As a consequence, additional sources of income are necessary, for example through contacts to input suppliers, market actors or processing enterprises. The organisational entity mentioned above can facilitate negotiations for such payments.
- CBOs are not well-placed to facilitate advisory services and the work of agronomists in our research areas. Generally, CBOs may have the potential to cooperate with agronomists if certain structures exist and if resources are available for additional tasks. However, for such a role a high level of trust and a general openness to group advice are paramount.

In conclusion, the study reaches fairly optimistic conclusions regarding fee-based agricultural advisory systems, partly helped by the favourable context in which Sarob operates. Generally, supporting institutions and time are both crucial factors in getting this approach underway and eventually providing a sustainable long-term solution to advisory services.

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6.2 Interviews

Table 4: Expert interviews

Expert	Name	Location	Reference
USAID	Don Van Atta, Sadriddin Juraev, Aviva Kutnick	Dushanbe	EXP1
Ministry of energy	Parviz Atoev (head of department), Tagoimurod Gulov	Dushanbe	EXP2
Oxus	Vatansho Vatanshoyev	Dushanbe	EXP3
GIZ Cross-Border trade	Hamid Rahmanov	Dushanbe	EXP4
Imon	Akbar Inoyatov, Mehridin Bokirov	Dushanbe	EXP5
GIZ Value Chains	Frank O'Sullivan, Olim Bobokalonov	Dushanbe	EXP6
Presidential apparatus	Mr. Piriev Jalil, Mr. Oymatov	Dushanbe	EXP7
IOM	Muzafar Zaripov, G. Kamolova	Dushanbe	EXP8
IFC	Mr. Adkham Ergashev, Mr. Farrukh Karimbaev, Mr. Eshbadalov Mukhammadjon	Dushanbe	EXP9
CARITAS	Monica Frey	Dushanbe	EXP10
DFID	Heloise Troc, Mahvash Kalandarova	Dushanbe	EXP11
GIZ NRM	Kathrin Uhlemann	Dushanbe	EXP12
Union of Dehkan Farms	Nazriev Nurali	Dushanbe	EXP13
Center for Strategic Research	Farida Muminova	Dushanbe	EXP14
FINCA	Sergey Kim	Dushanbe	EXP15
Ministry for economic development	Nazriev Saidrahmon	Dushanbe	EXP16
JICA	Hideki Tanabe, Azizbek Sattorov	Dushanbe	EXP17
Sarob regional	Chamangul Abdulsalomova	Dushanbe	EXP18
Sarob training	Yormuhammad Bozoriev	Dushanbe	EXP19
Sarob business development	Rahimov Rustamjon, Qiyomuddin Izatov, Jamshed Sanginov	Dushanbe	EXP20
GIZ Finance	Parviz Atoev, Firusa Saforova	Dushanbe	EXP21
EU	Christian Ben Hell	Dushanbe	EXP22
FAO	Ibrohim Ahmadov (National Consultant)	Dushanbe	EXP23
AAT	Mr. Schurabatov	Dushanbe	EXP24
Azal	Sergey Nazarov, Behruz Miralibekov	Dushanbe	EXP25

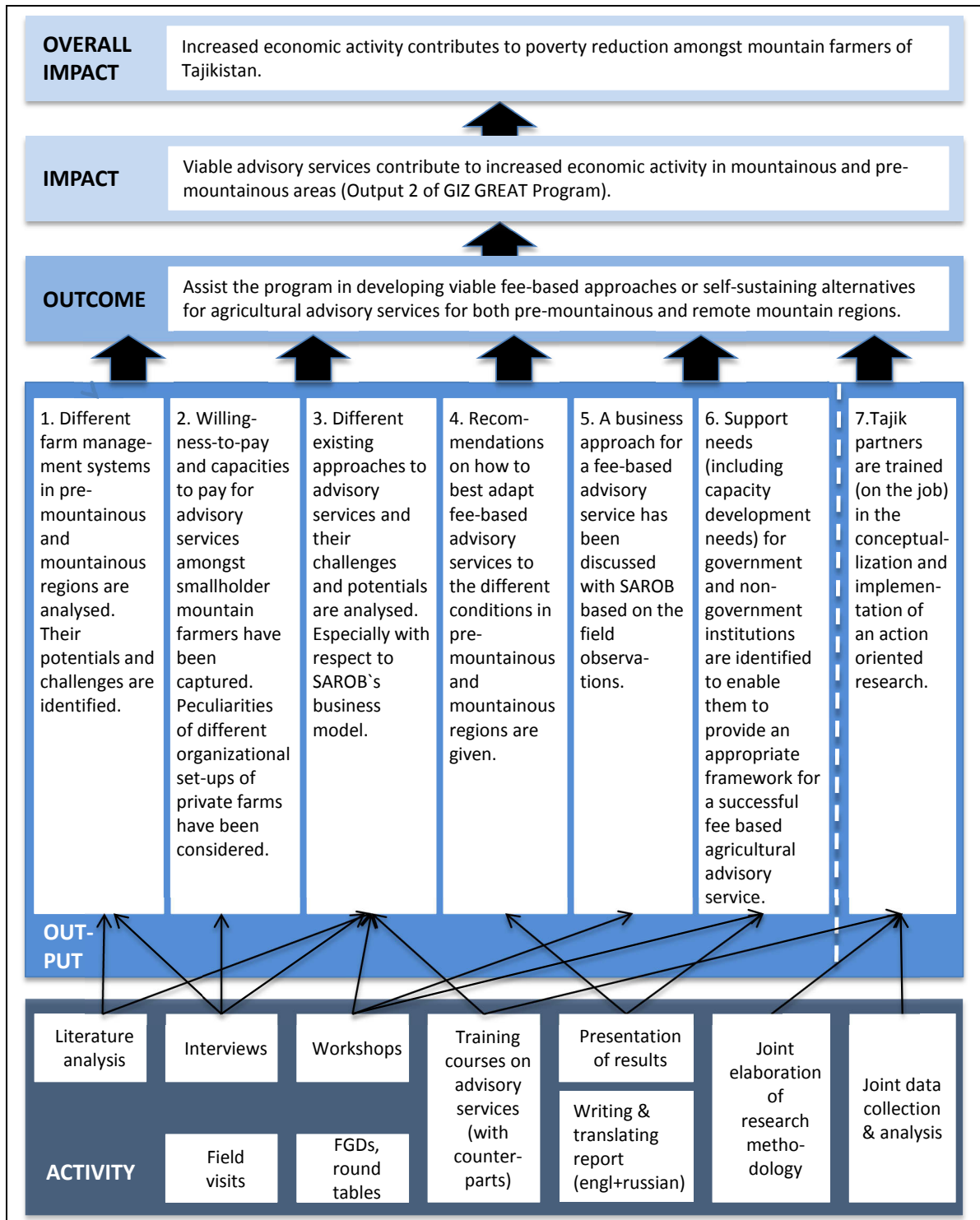
Expert	Name	Location	Reference
AFC – FFPSPD	Torsten Swoboda	Dushanbe	EXP26
Hukumat Muminabad	Rizoev Dilshod	Eastern Khatlon	EXP27
FINCA Muminabad	Sadriddin Odinaev	Eastern Khatlon	EXP28
OYLA	Tolibov Nazirnat	Eastern Khatlon	EXP29
Oxus Muminabad	Hisrav Saidov	Eastern Khatlon	EXP30
MSDSP Muminabad	Sitoramo Shirinova	Eastern Khatlon	EXP31
ZamZam Muminabad	Kabarov Zafar, Nazarova Zainabi, Huseinova Ozoda	Eastern Khatlon	EXP32
Hukumat Khovaling	Goibov Jamahon	Eastern Khatlon	EXP33
Consultant PSD	Saidrahmonov Saidali	Rasht Valley	EXP34
Head of Jamoat	NN (Rais Jamoat Kalai Labio)	Rasht Valley	EXP35
MSDSP Gharm	OsimovIsлом Anvarovich	Rasht Valley	EXP36
Women’s organization Navdi	Satorova Malumbi	Rasht Valley	EXP37
Hukumat agricultural dept. Tajikabad	Talbonov Kurbon	Rasht Valley	EXP38
Agrofinance bank Tajikabad	Nematov Anrajon	Rasht Valley	EXP39
First MicrofinanceBank Tajikabad	Naimov Rakhmatullo	Rasht Valley	EXP40
“Surkhob” Association, SME development Tajikabad	Saydali Shomadov	Rasht Valley	EXP41
Final workshop Sarob and agronomists	Rizo Urinbaev, Mukhamadi Muminov (both Sarob), Nasifov Hakim, Boronov Ibrohim, Gafurov Zaydullo (agronomists)	Dushanbe	EXP42

Table 5: Focus group discussions

Type	Location	Reference
Agronomist	Muminabad	FGD ₁
Women	Muminabad	FGD ₂
MFI	Muminabad	FGD ₃
Farmers	Muminabad	FGD ₄
VO	Gharm	FGD ₅
Farmer & Agronomist	Gharm	FGD ₆
NGO, Hukumat	Gharm	FGD ₇

7 Annex

Annex 1: Impact Analysis



Annex 2: Farmer questionnaire

Questionnaire: Farmer

1. Identification

Agronomist or Farmer, Date, Interviewers, Rayon, Jamoat, Nr des Interviews. Example: A01eebb_gana_1

2. Gender

☐ Male

☐ Female

3. Legal farm type

☐ Household farm

☐ Family dekhan farm

☐ Individual dekhan farm

☐ Enterprise

☐ Collective dekhan farm

4. How many people are living in your household?

Definition of household: living under one roof and having one cooking facility (eating from one pan).

_____ People

5. How many people of your household are away within the country?

_____ People

6. How many people of your household are away outside the country?

_____ People

7. Why are people away?

Questionnaire: Farmer Seite 2

8. What is your educational background (degree and subject)?

9. How many years have you been working as a individual/family/collective dekhan farmer in your life?

Refer to the type of farm that was given under question 3.

_____ Years

10. What prompted you to work as a (XX) farmer (XX) years ago?

The second XX refers to the answer given in 9. E.g. "What prompted you to work as an individual dekhan farmer 5 years ago?"

11. How old are you?

_____ Years

12. Do you have any livestock?

☐ Yes ☐ No ☐ Idk

13. How many sheep/goats do you have?

_____ sheep/goats

14. How many cows do you have?

_____ cows

15. How many chicken do you have?

_____ chicken

Questionnaire: Farmer Seite 3

Question 16-19: Clarify which parts of the land are rented.

16. What is the size of the land you cultivate?

Total land that you work on.

_____ ha

17. Do you (partly) rent the land from somebody else?

☐ Yes☐ No☐ Idk

18. If yes, how many ha do you rent?

_____ ha

19. How much of this land is irrigated?

_____ ha

20. What crops do you grow?

☐ Apples☐ Melons☐ Pistaches☐ Apricots☐ Nuts☐ Pomegranate☐ Beans☐ Onions☐ Potatoes☐ Corn☐ Other cereals☐ Salad☐ Cucumber☐ Other fruits☐ Tomatoes☐ Fodder☐ Other vegetables☐ Wheat☐ Grapes☐ Peaches☐ Others

21. Please indicate for the three main crop that you grow, the size of land used and the yield from your last harvest.

Important to have a reference e.g. yield per sotok/ha.

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Questionnaire: Farmer Seite 4

Question 22-24: Only ask if respondent grows wheat, potatoes or apples.

22. How much of your total potatoe harvest do you use on average for own consumption?

_____ %

23. How much of your total apple harvest do you use on average for own consumption?

_____ %

24. How much of your total wheat harvest do you use on average for own consumption?

_____ %

25. How much of your other main crops do you use for your own consumption?

Please indicate this as % per crop.

26. Who decided to grow these crops and why?

If the farmer has any orchards:

27. How old are the orchards?

☐ 0-5

☐ 16-20

☐ 31-35

☐ 46-50

☐ 6-10

☐ 21-25

☐ 36-40

☐ Remarks

☐ 11-15

☐ 26-30

☐ 41-45

Questionnaire: Farmer Seite 5

28. Where do you sell your crops?

Please indicate products sold, quantity (kg) and the selling point (direct, middleman, processing facilities, other).

29. At which price did you sell your three major crops in 2013?

Please indicate products sold and price fetched per kg.

30. How much money do you earn annually from the whole crop production?

Average

_____TJS

31. Do you employ (seasonal) workers?

☐ Yes ☐ No ☐ Idk

32. If yes, how many workers do you employ?

_____People

33. Does the household have any other sources of income apart from agriculture?

☐ Yes ☐ No ☐ Idk

34. If yes, which and how much do you earn from them?

Questionnaire: Farmer Seite 6

Only ask if somebody is abroad for work.

35. How much money do you receive from abroad on average?

To be calculated on a monthly basis.

_____ TJS

Only ask if interviewee has livestock.

36. How much money do you earn annually from livestock production?

_____ TJS

37. How do you earn money from livestock?

e.g. milk, meat, trade etc.

38. Do you have a land certificate for your fields?

If no, go to question 42.

☐ yes ☐ no ☐ Idk ☐ Remarks

39. If yes, since when?

Number of Years

_____ Years

40. If yes, until when?

41. Are you allowed to sell or pass on your land certificate?

☐ Yes ☐ No ☐ Idk ☐ Remarks

Questionnaire: Farmer Seite 7

42. Did you hear about farmers being alienated from their land?

☐ Yes ☐ No ☐ Idk

43. Do you expect to be alienated at some point?

☐ Yes ☐ No ☐ Idk

44. Please elaborate:

Questionnaire: Farmer Seite 8

45. Which five major challenges do you face in order increase your income from agricultural production?

IMPORTANT: To be framed as an open question, not mentioning possible challenges. Stress also that the farmer can mention challenges which are related to income generation and not only to production.

- ☐ Access to Credit (m)
- ☐ Greenhouse (m)
- ☐ Processing (m)
- ☐ Storage (m)
- ☐ Seed Quality (m)
- ☐ Fertilizer (m)
- ☐ Information on market prices (m)
- ☐ Knowledge about farming techniques (m)
- ☐ Condition of irrigation system (m)
- ☐ Diseases / pests (m)
- ☐ Availability of labour force (nm)
- ☐ Availability of land (nm)
- ☐ Access to water (nm)
- ☐ Access to market (m)
- ☐ Low market prices (nm)
- ☐ Low yield (m)
- ☐ Access to mechanisation
- ☐ Bureaucracy (tax reports, farm reports etc.) (nm)
- ☐ Corruption (nm)
- ☐ Infrastructure (nm)
- ☐ Extreme weather conditions (nm)
- ☐ Soil quality (nm)
- ☐ Others/remarks

46. From where do you get information on new farming techniques or crop varieties?

(e.g. neighbor, cousin, newspaper, advisory service...)

Questionnaire: Farmer Seite 9

47. Have you been provided with agricultural services?

(e.g. pruning, advice, spraying etc.) If no, go to question 52.

☐ Yes ☐ No ☐ Idk

48. If yes, which ones?

49. Were you satisfied with the agricultural services received?

On a scale from 1 to 5, 1 being the worst and 5 the best, how satisfied were you?

_____ scale

50. Please elaborate.

Find out why he/she was satisfied or not satisfied. Possible aspects could be reliability, quality of advice etc.

51. Was there an improvement in production?

52. If no: do you know any agricultural service providers?

If no, go to question 56.

☐ Yes ☐ No ☐ Idk

Questionnaire: Farmer Seite 10

53. If yes, which ones?

54. How did you know about these agricultural service providers?

55. Why did you not use them?

Make clear that the following questions are hypothetical.

56. Would you be interested in additional agricultural services that increase your production or income from agricultural activities?

If respondent says no or I do not know; confront him/her with the following scenario: "Imagine an agricultural expert would come to you on a regular basis and advise you how to increase your production and income. Thereby increasing your yields". (If it is obvious that farmer can not relate to the scenario, give a couple of examples of SAROB services).

If no, go to question 60.

☐ Yes

☐ No

☐ Idk

☐ It depends

If yes or it depends:

57. For which specific service (advice and activity)?

Questionnaire: Farmer Seite 11

58. Would you be willing to pay a fee to receive these agricultural services?

IMPORTANT: Check question 43 for major constraints of individual farmer and mention these.

If no, go to question 60.

☐ Yes ☐ No ☐ ldk

59. If yes, how much would you be willing to pay for these services?

_____TJS

If no or I do not know in question 56, ask question 60-62:

60. Would you be willing to pay for services that increase your production by 20%?

If no, go to question 64.

☐ Yes ☐ No ☐ ldk

61. How much would you be willing to pay per season and per ha?

62. For what specific services would you pay for?

63. Would you prefer to pay in kind or cash?

☐ Kind ☐ Cash ☐ I do not care ☐ Remarks

Questionnaire: Farmer Seite 12

"Imagine that the agronomist would not come to your farm personally, but would offer advice to a group of farmers."

64. Would you (still) be willing to pay a fee to receive these services?

If no, go to question 69.

☐ Yes ☐ No ☐ Idk

65. If yes, how much would you be willing to pay per season and per ha?

_____ TJS

If no and earlier WTP > 0:

66. Why would you not be willing to pay on a group basis?

67. Are you member of a village organisation, mahalla committee or any other local organization?

If no, go to question 75.

☐ Yes ☐ No ☐ Idk

68. If yes, which one?

69. Do you pay a membership fee to that organization?

☐ Yes ☐ No ☐ Idk

70. If yes, how much do you pay per year?

_____ TJS

Questionnaire: Farmer Seite 13

71. How is the village organisation involved in addressubg farmers' challenges with respect to agriculture?

This question should lead to an open discourse, which helps us to get an idea of the decision making, responsibilities, community actors as well as cooperative processes at local level.

72. Do you think that a fee-based system is possible which provides you with a good advisory system and the agronomist with a good income?

73. Remarks

Annex 3: Agronomist questionnaire

Questionnaire: Agronomists_SLE/GIZ TJK 2014

Agronomist or Farmer, Interviewers, Rayon, Jamoat, Nr des Interviews. Example: A01eebb_gana_1

1. Identification

2. Sex
a ☐ male b ☐ female
3. What is your highest educational degree?

4. Do you have any other jobs besides being an agronomist? If yes, which ones?

5. What are the three major sources of your household income?

6. How much of your income is generated by advisory services?
_____ %
7. How much of your income is generated by advisory services?
_____ TJS
8. Do you have land that you use for agriculture or livestock?

9. For how many years have you been working as an agronomist?
_____ Years
10. How old are you?
_____ Years
11. As an agronomist, have you always been working for the same employer? Please indicate the current and former employers.

12. Which services do you provide as an advisor?
Please clarify if it is an activity conducted by the agronomist or a verbal advice. Please make clear in the answers if it is an activity, advise or investment.

13. Are you specialized in a specific topic like livestock, irrigation or a specific crop? Please elaborate.

14. How do you find your clients or how do potential clients find you?

Questionnaire: Agronomists_SLE/GIZ TJK 2014 Seite 2

15. How many clients do you serve as an agronomist?

(Activity and advise)

16. What is the smallest and the biggest size of farms you serve?

What is the average size of farms?

17. How far is the nearest and furthest farm you serve from your place you live? What is the average distance?

18. Do you advice more individual, family or collective dekhan farms? Please indicate the share of each managment type

19. If you advice collective farms, who is your contact person (head of the farm or shareholder)?

20. Which are the major crops and livestock on the farms your serve?

21. How do you advice farmers (verbally, demoplots, classroom training, on-site visits, cell-phone etc.) ? Please describe the advantages of the methods you mainly use.

22. Do you advice farms run by women and do they have different advisory needs that you can describe? (Specify the differences between advising male and female farmers)

23. What is the role of women in decision-making processes related to the farm?

24. How often do you visit a farm that you advice/provide service to (per week/per month/per year)?

Questionnaire: Agronomists_SLE/GIZ TJK 2014 Seite 3

25. How does the contact to farms you advise vary from season to season (influencing factors)?

26. What are the expenses related to your advisory activity (preferably monthly)?

Transport, Administration, Communication, Training, Others

27. Does your income from advisory services cover the costs related to these services? And if not why do you work as an advisor anyways?

28. Is there a jamoat agricultural advisor and how do you cooperate with him?

29. Is there any competition/ cooperation between you and other agricultural advisors? Please elaborate

30. Whom do you contact in case you get an question in an area you are not an expert in? (source of information)

31. How do you acquire information on new developments concerning agricultural production /techniques? How do you up-date your knowledge relevant for your work as an advisor (lifelong learning process)?

32. How do you check if your service has been successful? (Feedback on service)

Questionnaire: Agronomists_SLE/GIZ TJK 2014 Seite 4

33. What kind of extra training would you need to better deal with the farmers' problems? (specific agricultural topics, tax/admin issues, access to credits/markets)

34. How is your work as an advisor affected by the land reform?

35. In the beginning you mentioned that you provide advice and services on...Why do you provide advice and services on these issues and not on others (livestock/administration/financing/processing/selling/storage/income)?

36. When you think about the above mentioned service, which are the major challenges (be specific)?

37. Is there a specific time during the year when the farmer pays for your advice or service? (after harvest/after given advice...)

38. How does the farmer pay for your service? (per ha/per service/advice/hour/season, others)

39. Do you charge differently for your advice (words) and activities (pruning, spraying...)?

40. And how much do you charge (amount of money or share of harvest / in kind / in cash)

Questionnaire: Agronomists_SLE/GIZ TJK 2014 Seite 5

41. How many farmers you advise pay in kind/cash?

42. Have you encountered any problems with the payment of your services?

How many do not pay?

43. What do you do in case the farmer does not deliver the payment?

44. Are you a member of Sarob?

45. If yes, for how long have you been working with Sarob?

____ Years

46. If no, do you know Sarob and would you be interested in being a member and why?

47. If yes, why are you not a member?

48. Where did you learn/ get to know about Sarob?

49. What kind of services and trainings have you received from Sarob and how often?

50. Do you inform Sarob about your activities (frequency of exchange/feedback/reporting/monitoring)?

Questionnaire: Agronomists_SLE/GIZ TJK 2014 Seite 6

51. How does Sarob help to promote your activities?

52. What are the advantages and disadvantages of being a member of Sarob?

53. Which services and trainings that you mentioned above (to better deal with the farmers' problems) should be offered by Sarob? Why?

54. What are your suggestions to improve the current advisory systems in the mountainous regions of Tajikistan?

55. Are you as an advisor in contact with community based organisations (Mahalla committee) or other groups of farmers/village organisations/ associations of dekhon farms? Please give examples and describe your relationship.

56. Do you provide advice or services also for groups of farmers? (why? why not?)

57. When you think about group advise, what would be a good group size and how should it be composed? (same crops/ management type/ gender/ age...)

58. How would a training or a service for groups change your way of charging and how would you calculate the fee?

Questionnaire: Agronomists_SLE/GIZ TJK 2014 Seite 7

59. What characterizes a good advisor?

Annex 4: Advisory services requested (topic)

Demanded Service	Frequency	%
Vaccination / livestock	4	2
Pruning	19	9
Spraying / pesticides	39	19
Planting period	4	2
General advice	33	16
Income maximisation, storage, marketing	16	8
Provision of / information on seeds	26	13
Solution of water problem	4	2
Use and timing of fertilizer	24	12
Specific services	4	2
Irrigation	7	3
All	6	3
Soil quality	9	4
Others	6	3
Total	201	100

Annex 5: Set cards agronomists

Personal set card	Agronomists interviewed
Age (average)	50 years
Gender	16 male, 1 female
Educational background	University degree: 13, technical school: 3, unknown: 1
Sources of household income	Farming and advisory activities: 47 %, others: honey production, tree nursery, teacher, shop, project work, government jobs
Farming activities	Owners of farming land and livestock: 100 %

Annex 6: Hypothetical Profit & Loss Account and Break Even Analysis

	Agronomist 1	Agronomist 2	Agronomist 3	Question- naire	Average	Break Even (WTP)	Break Even (clients)
Required Income/month	1000	1600	1700	–	1433.3	1433.33	1433.33
Clients	30	110	35	32	52	52	61
Average ha/client	3	1	10	5.11	4.78	4.78	4.78
Variable cost/month	400	–	–	367	383.5	383.5	383.5
Total ha	90	110	350	163.1	178.3	178.3	290.69
WTP/ha	–	–	–	75	75	122.3	75
Income/month (75TJS/ha)	562.5	687.5	2187.5	1019.1	–	–	–
Profit/month	162.5	304	1804	635.63	726.5	1433.33	1433.33
Profit/month as percent of required income	16 %	19 %	106 %	44 %	46 %	100 %	100 %

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